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The Impact of Health Technology Use on Digital Literacy Among Communities: An Empirical Study in Tanzania

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ABSTRACT

Purpose of the study: This This study investigates the relationship between health technology use and digital literacy skills in the general community, particularly in the context of Tanzania, where the adoption of digital health tools is gaining momentum. The rapid integration of information technology (IT) in health services—such as telemedicine, e-health records, and mobile health applications—has made digital literacy an essential skill for individuals to access and utilize these technologies effectively.

Methodology: Through a mixed-methods approach, this study gathered data from 220 respondents from Tanzania, exploring their digital literacy levels and attitudes toward health technology.

Main Findings: The results revealed that 58.6% of respondents had a positive view of health technology, with 62.3% demonstrating strong digital literacy skills. A regression analysis identified a significant positive relationship between health technology use and digital literacy, explaining 65.1% of the variance in digital literacy skills ($R^2 = 0.651$). Qualitative interviews provided deeper insights, highlighting barriers faced by older adults and individuals with lower educational backgrounds, particularly in accessing and utilizing digital health services.

Novelty/Originality of this study: This study contributes to the growing body of knowledge on the intersection of health technology adoption and digital literacy by emphasizing the socio-demographic disparities in access. It calls for targeted digital literacy training as an integral part of public health programs, ensuring that all demographic groups, particularly vulnerable populations, can fully benefit from digital health innovations. The study also proposes policy interventions to bridge the digital divide and improve equity in healthcare access.

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1. INTRODUCTION

The current era of globalization is marked by very rapid technological developments, including in the field of Information Technology (IT) which has penetrated almost all aspects of human life. IT is defined as the use of electronic equipment to store, analyze, and distribute information through various media such as the internet [1]-[3]. In the health sector, the application of IT has experienced significant developments, including hospital administration management, technology-based medical services, and the acceleration of health science research

[1]-[5]. According to the World Health Organization (2019), the application of IT in the health system has the potential to increase the effectiveness of services, accelerate medical decision-making, and expand access to services to communities that were previously difficult to reach [6]-[8]. This is becoming increasingly important given the rapid growth of knowledge in the medical field, with more than 750,000 new scientific articles published each year [9]-[11], which requires medical personnel to utilize various digital tools to keep up with the latest developments.

In addition to service providers, the development of IT also demands community readiness, especially related to digital literacy in health (health digital literacy). Digital health literacy refers to an individual's ability to access, understand, evaluate, and use health information from digital platforms to improve their own health [12]-[14]. High digital literacy enables people to more effectively use technology-based health services, such as telemedicine, health monitoring applications, and online medical information [15]-[17]. Found that good health literacy is associated with effective use of digital technology in seeking health information, which has an impact on improving personal health decision-making. However, low levels of digital literacy in certain groups, especially in rural areas or in the elderly, are a serious challenge in equitable distribution of the benefits of health technology [18]-[20].

Several studies have shown that digital technology plays an important role in improving health literacy and the effectiveness of community interventions. In addition, IT brings great benefits to health services such as increasing accessibility through telemedicine [21], operational efficiency through Electronic Health Records (EHR) [22], improving the quality of evidence-based services [23], and increasing patient participation in self-management of health through mHealth applications [24]. However, various major challenges are still faced in the implementation of IT in the health sector, especially related to limited infrastructure in certain areas, low human resource (HR) capacity, threats to patient data security and privacy [25], [26], and the digital divide that widens inequality in access to services [27], [28]. In addition, regulations that are not fully adaptive to technological developments are a serious obstacle [29], [30].

These challenges show that IT adoption in health services requires not only technological innovation, but also institutional readiness, regulatory support, and strengthening of human resources and community capacity through digital health literacy programs. In this context, it is important to build a sustainable and inclusive digital health literacy training program so that all levels of society can access and utilize health technology optimally.

The novelty of this study lies in the holistic approach to IT integration in health services, emphasizing the importance of strengthening institutional capacity, developing digital health literacy in the community, and multi-sector collaboration to build a sustainable digital health ecosystem. The research gap identified is the lack of studies that comprehensively discuss institutional readiness, strengthening digital literacy among the community, and strategies for the sustainability of IT implementation in developing countries. In addition, the limited exploration of the application of technology based on local wisdom is also an important gap that needs to be filled in the development of the national health service system. Thus, this study aims to highlight the benefits of IT in health services, but also examine the challenges of digital literacy, and whether there is an influence between them.

2. RESEARCH METHOD

This study uses a mixed-method approach. The type used is sequential explanatory. Sequential explanatory is a study whose initial data collection is quantitative, then continued with qualitative data, meaning that the quantitative data is strengthened by the qualitative data to be obtained [31]-[33]. The sample in this study was 220 people in Tanzania who were selected using random sampling techniques.

The instrument used in this study was the Response Questionnaire regarding ICT. This questionnaire measures how the community responds to technology in health. Respondents will be asked to provide an assessment based on a Likert scale (1-5). This questionnaire has been tested for validity and reliability, with a Cronbach's Alpha value of 0.84, which indicates that this instrument is reliable for measuring student responses. Digital Literacy Test: This test measures digital literacy skills, including the ability to access, analyze, evaluate, and create digital content. The following are categories of community responses to technology in health and digital literacy, including very good, good, less good, and very less good, as in Table 1.

Table 1. Categories of Response Society using ICT and Literacy Digital

Categoty	Interval	
	Response of Augmented Reality Media	Digital Literacy
Very Not Good	24.0 – 42.0	10.0 – 17.5
Not Good	42.1 – 60.0	17.6 – 25.0
Good	60.1 – 78.0	25.1 – 32.5
Very Good	78.1 – 96.0	32.6 – 40.0

The collected data will be analyzed using descriptive statistics and inferential statistics. Descriptive statistics will describe the characteristics of community responses to technology and digital literacy skills. In contrast, simple regression analysis will be used to test the effect of technology in health on digital literacy skills. Data analysis was carried out using SPSS statistical software to obtain more accurate results and can be interpreted objectively.

3. RESULTS AND DISCUSSION

The results of the questionnaire and questions given were analyzed using the SPSS 21 application and can be seen in tables 2 and 3.

Table 2. Results of community response to the use of technology in health

Classification					Mean	Min	Max	%
Range	Respond	M	F	Total				
24.0 – 42.0	Not very good	8	7	15	68	38	92	6.8
42.1 – 60.0	Not good	10	13	23				10.4
60.1 – 78.0	Good	57	72	129				58.6
78.1 – 96.0	Very good	27	26	53				24.2
TOTAL		102	118	220				100

From table 2 which comes from 220 respondents, after being processed and the results obtained using the SPSS 21 application program, the community's response to the use of technology for health has a dominant good result with a percentage of 58.6% as many as 129 students from a total of 220 students, very good as many as 24.2% as many as 53 students from a total of 220 students, less good as many as 10.4% as many as 23 students from a total of 220 students, and very poor as many as 6.8% as many as 15 students from a total of 220 students. From 220 students, the mean result was 68, the maximum value was 92, and the minimum value was 38.

Table 3. Results of society digital literacy skills

Classification					Mean	Min	Max	%
Range	Respond	M	F	Total				
10.0 – 17.5	Not very good	7	6	13	28	15	38	5.9
17.6 – 25.0	Not good	11	14	25				11.4
25.1 – 32.5	Good	61	76	137				62.3
32.6 – 40.0	Very good	23	22	45				20.4
TOTAL		102	118	220				100

From Table 3 which comes from 220 respondents, after obtaining the results will be processed using the SPSS 21 application program, in digital literacy skills, the dominant results are good with a percentage of 62.3% as many as 137 students from a total of 220 students, very good at 20.4% as many as 45 students from a total of 220 students, less good at 11.4% as many as 25 students from a total of 220 students, and very poor at 5.9% as many as 13 students from a total of 220 students. From the 220 students, the mean results were 28, the maximum value was 38, and the minimum value was 15.

Table 4. Results of the influence of community responses to the use of technology in health on digital literacy.

Variabel	Unstandardized Coefficients		Standardized Coefficients	t	sig.
	B	Std. Error	Beta		
1 (Constant)	12.128	3.151		4.513	.000
Digital Literacy	.115	.124	.123	1.129	.014

Table 4 shows the results of a simple regression test showing the regression equation is Y = 12.18 + 0.115X. The magnitude of the contribution of technology use in health to digital literacy skills can be seen in Table 5 below.

Table 5. Contribution of Technology Utilization in Health to Digital Literacy Skills

Model	R	R square	Adjust R Square	Std. Error of the Estimate
1	.807	.651	.672	2.418

The results of the simple regression analysis showed a coefficient of determination (R2) of 0.651. This means that the contribution of technology in health to digital literacy skills is 65.1%, while the remaining 34.9% is influenced by other variables.

The results of the study showed that in general the public response to the use of technology in the health sector was in the "good" category with a percentage of 58.6%, while the community's digital literacy skills were also classified as "good" with a percentage of 62.3%. These data show that the majority of people are quite capable of utilizing technology to access health services. This finding is in line with Topol's opinion (2019) which states that the integration of technology in health services can accelerate access and expand the reach of services to the wider community.

Furthermore, the results of a simple regression analysis showed a positive relationship between the use of health technology and digital literacy skills (sig = 0.014), with a coefficient of determination (R^2) of 0.651. This means that 65.1% of the community's digital literacy skills are influenced by the use of health technology, while 34.9% are influenced by other factors. This finding strengthens the theory of Norman and Skinner (2006) which states that digital health literacy is highly dependent on the level of exposure and use of health information technology.

This quantitative data support is strengthened through interviews with health workers and the community. One health worker stated:

> *"Currently, the use of health applications such as telemedicine or e-medical records is quite helpful in accelerating services. However, for the elderly, many still have difficulty accessing digital services."*

This statement confirms that some respondents (10.4%) responded "less well" to the use of health technology and 11.4% of respondents with "less good" digital literacy levels. This phenomenon is consistent with the research of van der Vaart and Drossaert (2017) which highlights the "digital divide", especially in the elderly and people with low levels of education. In contrast, interviews with younger respondents showed positive acceptance of the use of digital-based health technology. One student said:

> *"I usually check health information through digital applications. It feels easier and faster, especially if I want to consult without having to go to the hospital first."*

This statement supports the results of the study by Stoumpos et al. [34]which found that the younger generation tends to be more adaptive to health technology, which ultimately increases the effectiveness and efficiency of health services. In addition, the results of an interview with Mr. (52 years old) showed the challenges of medical literacy:

> *"I think health technology is good, I can consult via cellphone. But sometimes I am confused about how to register online or read information that contains a lot of medical terms."*

This makes it clear that digital literacy does not only include the technical ability to operate devices, but also the cognitive ability to understand medical terms and information [35]. Thus, digital literacy education programs must pay attention to linguistic aspects and content understanding.

Based on the results of the study showing a positive relationship between the use of technology in health services and the digital literacy skills of the community, this finding is reinforced by a number of relevant previous studies. The study by Zhao et al.[36], in rural China found that digital literacy significantly affects people's participation in digital health behaviors, such as seeking health information, using health applications, and online consultations. This is in line with the results of the study which showed that the majority of respondents (62.3%) had a good level of digital literacy, and 58.6% had a positive response to the use of health technology. Both of these findings reflect that increased exposure to health technology also increases people's digital competence in the context of health.

Research by Ji et al. [37] also revealed that factors such as age, education, and intensity of internet use for health purposes have a significant influence on digital health literacy. This explains the less than satisfactory response results from some respondents (around 10.4% for technology use and 11.4% for digital literacy), who are likely from older age groups or with lower education. The study underlines the need for an inclusive and adaptive approach to improving digital literacy across all levels of society.

Meanwhile, a study in Indonesia by Algifari et al. [38], shows that people's digital skills are still limited to technical aspects, and have not touched much on cognitive understanding of health information. This is in line with qualitative interviews in this study, which show that although some people are able to access health applications, they still have difficulty understanding medical terms or procedures in the application. This phenomenon is also reinforced by Nutbeam's theory (2000) regarding the importance of functional and conceptual literacy in digital health, not just technical skills.

Furthermore, Cheng et al.[39] in the journal JMIR Medical Informatics found that high levels of digital literacy encourage the use of personal medical records and increase patient engagement in the digital healthcare process. This contributes to increased efficiency and effectiveness of services, as reflected in the positive response of the younger generation to health applications in this study. Another study by Li et al. [40], also emphasized that digital literacy can improve healthy living behavior, especially in the elderly in rural areas. Overall, the findings

in this study are in line with previous studies showing that digital literacy plays an important role in supporting the adoption of health technology. These skills not only include technical skills, but also include cognitive skills in understanding and utilizing health information effectively. Therefore, improving digital literacy must be an integral part of the strategy for developing inclusive and sustainable digital health services.

This study offers novelty by examining the relationship between the use of health technology and digital literacy skills at the general community level, not just among medical personnel. This study also combines quantitative and qualitative approaches (mixed methods) to provide a more comprehensive picture. The implications of this study indicate that increasing community digital literacy contributes greatly to the use of digital-based health services. This requires an integrated digital literacy training program in public health programs. In the era of digital transformation, this ability is key to optimizing fast, effective, and inclusive health services. This study has limitations in the relatively limited number of samples (only 220 respondents) compared to the total population. In addition, the data obtained are cross-sectional, so they cannot capture changes in community perceptions over a long period of time. Other factors that may influence digital literacy, such as education level and income, have not been analyzed in depth.

4. CONCLUSION

Based on the results of the study, it can be concluded that there is a positive relationship between the use of technology in health services and the digital literacy skills of the community. In general, the community shows a good response to the use of technology in the health sector, and most also have adequate digital literacy skills. This shows that the more often the community is exposed to health technology, the better their ability to understand and utilize digital information related to health. This finding has important implications for the development of digital-based health services, namely the need to integrate digital literacy improvement programs into every effort to transform health services. The literacy program must include not only technical skills, but also the ability to understand medical information cognitively. For further research, it is recommended that a more in-depth study be conducted by involving a wider population and considering other factors such as age, education, and level of understanding of health information in order to obtain a more comprehensive and in-depth picture.

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REFERENCES

[1] S. Mishra and A. K. Tyagi, "The role of machine learning techniques in internet of things-based cloud applications," *Internet of Things*, no. January, pp. 105–135, 2022, doi: 10.1007/978-3-030-87059-1_4.

[2] S. Aminizadeh *et al.*, "The applications of machine learning techniques in medical data processing based on distributed computing and the Internet of Things," *Comput. Methods Programs Biomed.*, vol. 241, p. 107745, 2023, doi: https://doi.org/10.1016/j.cmpb.2023.107745.

[3] M. Kumar *et al.*, "Healthcare Internet of Things (H-IoT): current trends, future prospects, applications, challenges, and security issues," *Electron.*, vol. 12, no. 9, 2023, doi: 10.3390/electronics12092050.

[4] S. B. Junaid *et al.*, "Recent advancements in emerging technologies for healthcare management systems: a survey," *Healthc.*, vol. 10, no. 10, 2022, doi: 10.3390/healthcare10101940.

[5] D. Bhati, M. S. Deogade, and D. Kanyal, "Improving patient outcomes through effective hospital administration: a comprehensive review," *Cureus*, vol. 15, no. 10, 2023, doi: 10.7759/cureus.47731.

[6] H. M. Pontes *et al.*, "Measurement and conceptualization of gaming disorder according to the world health organization framework: the development of the gaming disorder test," *Int. J. Ment. Health Addict.*, vol. 19, no. 2, pp. 508–528, 2021, doi: 10.1007/s11469-019-00088-z.

[7] N. Assarzadegan and E. Montgomery, "What is new in the 2019 world health organization (WHO) classification of tumors of the digestive system: review of selected updates on neuroendocrine neoplasms, appendiceal tumors, and molecular testing," *Arch. Pathol. Lab. Med.*, vol. 145, no. 6, pp. 664–677, 2021, doi: 10.5858/arpa.2019-0665-RA.

[8] J. D. Khoury *et al.*, "The 5th edition of the world health organization classification of haematolymphoid tumours: myeloid and histiocytic/dendritic neoplasms," *Leukemia*, vol. 36, no. 7, pp. 1703–1719, 2022, doi: 10.1038/s41375-022-01613-1.

[9] Y. Li, N. Wang, and A. R. A. Latiff, "Development of the bamboo forest economy: reviewing China's 'bamboo as a substitute for plastic initiative' and its development," *Adv. Bamboo Sci.*, vol. 11, no. October 2024, p. 100130, 2025, doi: 10.1016/j.bamboo.2025.100130.

[10] N. Sun *et al.*, "Research trends and key contributors in studies on influenza vaccines for children: A 20-year bibliometric analysis," *Hum. Vaccines Immunother.*, vol. 21, no. 1, 2025, doi: 10.1080/21645515.2024.2443281.

[11] A. Ghasemi, P. Mirmiran, K. Kashfi, and Z. Bahadoran, "Scientific publishing in biomedicine: a brief history of scientific journals," *Int. J. Endocrinol. Metab.*, vol. 21, no. 1, pp. 1–10, 2023, doi: 10.5812/ijem-131812.
[12] K. Eumbunnapong, P. Wannapiroon, and P. Pornpongtechavanich, "An intelligent digital learning platform to enhance digital health literacy," *Int. J. Emerg. Technol. Learn.*, vol. 17, no. 4, pp. 95–111, 2022, doi: 10.3991/ijet.v17i04.27907.
[13] M. A. Choukou, D. C. Sanchez-Ramirez, M. Pol, M. Uddin, C. Monnin, and S. Syed-Abdul, "COVID-19 infodemic and digital health literacy in vulnerable populations: A scoping review," *Digit. Heal.*, vol. 8, no. 172, 2022, doi: 10.1177/20552076221076927.
[14] E. Kemp *et al.*, "Health literacy, digital health literacy and the implementation of digital health technologies in cancer care: the need for a strategic approach," *Heal. Promot. J. Aust.*, vol. 32, no. S1, pp. 104–114, 2021, doi: 10.1002/hpja.387.
[15] J. Yoon *et al.*, "Development and validation of digital health technology literacy assessment questionnaire," *J. Med. Syst.*, vol. 46, no. 2, p. 13, 2022, doi: 10.1007/s10916-022-01800-8.
[16] Y. T. Shen, L. Chen, W. W. Yue, and H. X. Xu, "Digital technology-based telemedicine for the COVID-19 pandemic," *Front. Med.*, vol. 8, no. July, pp. 1–23, 2021, doi: 10.3389/fmed.2021.646506.
[17] M. del Pilar Arias López *et al.*, "Digital literacy as a new determinant of health: A scoping review," *PLOS Digit. Heal.*, vol. 2, no. 10, pp. 1–21, 2023, doi: 10.1371/journal.pdig.0000279.
[18] T. M. Rasekaba, P. Pereira, G. Vinaya Rani, R. Johnson, R. McKechnie, and I. Blackberry, "Exploring telehealth readiness in a resource limited setting: digital and health literacy among older people in rural India (DAHLIA)," *Geriatr.*, vol. 7, no. 2, 2022, doi: 10.3390/geriatrics7020028.
[19] A. M. Kaihlanen *et al.*, "Towards digital health equity - a qualitative study of the challenges experienced by vulnerable groups in using digital health services in the COVID-19 era," *BMC Health Serv. Res.*, vol. 22, no. 1, pp. 1–12, 2022, doi: 10.1186/s12913-022-07584-4.
[20] L. L. Campanozzi, F. Gibelli, P. Bailo, G. Nittari, A. Sirignano, and G. Ricci, "The role of digital literacy in achieving health equity in the third millennium society: A literature review," *Front. Public Heal.*, vol. 11, 2023, doi: 10.3389/fpubh.2023.1109323.
[21] S. J. Achenbach, "Telemedicine: Benefits, Challenges, and Its Great Potential," *Heal. Law Policy Brief*, vol. 14, no. 1, pp. 1–26, 2020, [Online]. Available: https://heinonline.org/HOL/P?h=hein.journals/heallaw14&i=10
[22] D. Ng'andu and L. Haabazoka, "A study of the effect of health records digitalization on healthcare facility operational efficiency," *Open J. Bus. Manag.*, vol. 12, no. 02, pp. 1135–1157, 2024, doi: 10.4236/ojbm.2024.122060.
[23] L. Connor *et al.*, "Evidence-based practice improves patient outcomes and healthcare system return on investment: Findings from a scoping review," *Worldviews Evidence-Based Nurs.*, vol. 20, no. 1, pp. 6–15, 2023, doi: 10.1111/wvn.12621.
[24] S. Abasi, A. Yazdani, S. Kiani, and Z. Mahmoudzadeh-Sagheb, "Effectiveness of mobile health-based self-management application for posttransplant cares: a systematic review," *Heal. Sci. Reports*, vol. 4, no. 4, pp. 1–12, 2021, doi: 10.1002/hsr2.434.
[25] P. Bogaert, M. Verschuuren, H. Van Oyen, and H. van Oers, "Identifying common enablers and barriers in European health information systems," *Health Policy (New. York).*, vol. 125, no. 12, pp. 1517–1526, 2021, doi: 10.1016/j.healthpol.2021.09.006.
[26] H. Bagherian and M. Sattari, "Health information system in developing countries: a review on the challenges and causes of success and failure," *Med. J. Islam. Repub. Iran*, vol. 36, no. 1, 2022, doi: 10.47176/mjiri.36.111.
[27] C. K. Sanders and E. Scanlon, "The digital divide is a human rights issue: advancing social inclusion through social work advocacy," *J. Hum. Rights Soc. Work*, vol. 6, no. 2, pp. 130–143, 2021, doi: 10.1007/s41134-020-00147-9.
[28] S. A. Saeed and R. M. Masters, "Disparities in health care and the digital divide," *Curr. Psychiatry Rep.*, vol. 23, no. 9, p. 61, 2021, doi: 10.1007/s11920-021-01274-4.
[29] F. Alanazi, "Electric vehicles: benefits, challenges, and potential solutions for widespread adaptation," *J. Appl. Sci.*, vol. 13, pp. 1–23, 2023.
[30] J. Månsson *et al.*, "Understanding and overcoming obstacles in adaptive management," *Trends Ecol. Evol.*, vol. 38, no. 1, pp. 55–71, 2023, doi: 10.1016/j.tree.2022.08.009.
[31] R. R. González-Díaz and G. I. Bustamante-Cabrera, "Predictive sequential research design to study complex social phenomena," *Entropy*, vol. 23, no. 5, pp. 1–13, 2021, doi: 10.3390/e23050627.
[32] T. K. Haynes-Brown and M. D. Fetters, "Using joint display as an analytic process: an illustration using bar graphs joint displays from a mixed methods study of how beliefs shape secondary school teachers' use of technology," *Int. J. Qual. Methods*, vol. 20, pp. 1–14, 2021, doi: 10.1177/1609406921993286.
[33] Y. E. Chieng and C. K. Tan, "A sequential explanatory investigation of TPACK: Malaysian science teachers' survey and perspective," *Int. J. Inf. Educ. Technol.*, vol. 11, no. 5, pp. 235–241, 2021, doi:

10.18178/ijiet.2021.11.5.1517.
[34] A. I. Stoumpos, F. Kitsios, and M. A. Talias, "Digital transformation in healthcare: technology acceptance and its applications," *Int. J. Environ. Res. Public Health*, vol. 20, no. 4, pp. 1–41, 2023, doi: 10.3390/ijerph20043407.
[35] S. Nikou, M. De Reuver, and M. Mahboob Kanafi, "Workplace literacy skills—how information and digital literacy affect adoption of digital technology," *J. Doc.*, vol. 78, no. 7, pp. 371–391, 2022, doi: 10.1108/JD-12-2021-0241.
[36] B. Y. Zhao *et al.*, "Digital health literacy and associated factors among internet users from China: a cross-sectional study," *BMC Public Health*, vol. 24, no. 1, pp. 1–12, 2024, doi: 10.1186/s12889-024-18324-0.
[37] H. Ji, J. Dong, W. Pan, and Y. Yu, "Associations between digital literacy, health literacy, and digital health behaviors among rural residents: evidence from Zhejiang, China," *Int. J. Equity Health*, vol. 23, no. 1, pp. 1–20, 2024, doi: 10.1186/s12939-024-02150-2.
[38] M. H. Algifari, L. Zachary, R. P. Yuliani, H. Aditama, and S. A. Kristina, "Digital health literacy and its associated factors in general population in Indonesia," *Indones. J. Pharm.*, vol. 35, no. 2, pp. 355–362, 2024, doi: 10.22146/ijp.5640.
[39] C. Cheng *et al.*, "Digital health literacy as a predictor of awareness, engagement, and use of a national web-based personal health record: population-based survey study," *J. Med. Internet Res.*, vol. 24, no. 9, pp. 1–15, 2022, doi: 10.2196/35772.
[40] R. Li, J. Shao, and D. Gao, "The impact of digital literacy on the health behavior of rural older adults : evidence from China," *BMC Public Health*, vol. 25, no. 919, pp. 1–15, 2025, doi: 10.1186/s12889-025-21964-5.