

Digital Health Literacy and Its Impact on Digital Health Resource Utilisation and Preventive Health Behaviour: Evidence from Bamenda, Cameroon

*¹Paul O. B. Itor., ¹Elizabeth Ankiambom Chiatii., ²Njong Mom Aloysius

¹Department of Health Economics Faculty of Business and management Sciences, Catholic University of Cameroon, Bamenda, Cameroon

²Faculty of Economics and Management Sciences, The University of Bamenda, Bamenda, Cameroon

*Corresponding Author

DOI: <https://doi.org/10.47772/IJRISS.2026.100601141>

Received: 24 June 2026; Accepted: 30 June 2026; Published: 13 July 2026

ABSTRACT

Digital transformation in healthcare is reshaping how individuals access, interpret, and use health information; however, engagement with digital health systems remains uneven, particularly in low- and middle-income countries where disparities in access and capability persist. This study examines the relationship between digital health literacy (DHL), digital health resource utilisation, and preventive health behaviour among adults in Bamenda, Cameroon, while assessing the moderating role of socio-demographic factors. A quantitative cross-sectional survey design was employed, drawing on 437 valid responses from adult residents selected through stratified sampling. Data were collected using a structured questionnaire adapted from validated digital health literacy instruments and analysed using descriptive statistics, ordinary least squares (OLS) regression, and moderation analysis. The findings reveal that digital health literacy significantly predicts digital health resource utilisation ($\beta = 0.0348$, $p < 0.001$) and exerts an even stronger positive effect on preventive health behaviour ($\beta = 0.710$, $p < 0.001$). Age negatively influences both utilisation and preventive behaviour, while education demonstrates a consistent positive effect across models. Income and health insurance status are not statistically significant predictors, indicating that financial access plays a limited role once literacy is accounted for. Moderation analysis shows that age, education, and place of residence significantly condition the relationship between DHL and digital health utilisation, with stronger effects observed among younger, more educated, and urban populations. Gender does not significantly moderate the relationship. The study concludes that digital health literacy is a key determinant of digital health engagement and preventive health behaviour; however, its impact is shaped by structural and socio-demographic inequalities. These findings highlight the need for integrated digital health strategies that combine literacy enhancement with improvements in infrastructure and equitable access to ensure inclusive health system benefits in resource-constrained settings.

Keywords: Digital Health Literacy, Digital Health Utilisation, Preventive Health Behaviour, Digital Divide, Bamenda - Cameroon.

INTRODUCTION

Digital health transformation is one of the most significant developments in contemporary healthcare systems, reshaping how individuals access, interpret, and use health information. The rapid expansion of mobile technologies, internet connectivity, telemedicine platforms, and mobile health (mHealth) applications has created new pathways for delivering health information and services beyond traditional healthcare systems. These innovations have the potential to improve access to care, strengthen preventive health behaviour, reduce

healthcare costs, and enhance patient engagement in health decision-making (Jat & Grønli, 2024). However, the availability of digital health technologies does not automatically translate into effective use, as utilisation depends on individuals' capacity to meaningfully engage with digital health content.

This capacity is conceptualised as digital health literacy (DHL), defined as the ability to access, understand, evaluate, and apply digital health information for informed health decision-making (Norman & Skinner, 2006; CDC, 2024). DHL goes beyond basic digital skills by integrating technical competence, critical thinking, and health knowledge. Individuals with higher DHL are more likely to engage in self-care, use credible health information, and participate actively in healthcare decisions, whereas those with low DHL are more vulnerable to misinformation, delayed care-seeking, and poor health choices (Arias López et al., 2023; Kim et al., 2023).

Evidence increasingly shows that digital health literacy is a key determinant of health behaviour and digital health engagement. Studies indicate that digital literacy strongly predicts willingness to adopt mobile health applications and other digital health services (Fan et al., 2023). Systematic reviews further show that individuals with higher DHL demonstrate improved self-management behaviours, better health outcomes, and greater use of digital health resources (Arias López et al., 2023). Despite this, significant disparities remain in actual digital health utilisation, particularly in low- and middle-income countries.

In many developing contexts, including sub-Saharan Africa, growth in digital infrastructure has not been matched by equivalent levels of meaningful digital health engagement. While mobile phone ownership is widespread, the use of digital platforms for health purposes remains uneven due to limited internet affordability, low digital competence, weak trust in online health information, and socio-economic inequalities. This creates a persistent gap between digital access and effective utilisation (Singh & Grønli, 2024; WHO, 2021).

Cameroon reflects these inequalities. Although national strategies are promoting digital health systems and expanding digital services (Ministry of Public Health, 2020), structural barriers such as inconsistent internet access, affordability challenges, and uneven digital skills continue to limit effective use. In urban and peri-urban areas such as Bamenda, these disparities are particularly visible, shaped by differences in education, income, and socio-economic status.

From a health systems perspective, digital health utilisation is a key pathway through which health information influences behaviour and outcomes. Engagement with digital platforms can improve preventive health behaviour, treatment adherence, timely care-seeking, and patient empowerment. However, low utilisation contributes to misinformation, delayed care, and inefficient service use. Prior research confirms that digital literacy strongly influences behavioural intention and actual use of mHealth applications (Fan et al., 2023).

Theoretically, these relationships are explained through the Technology Acceptance Model (TAM), which emphasises perceived usefulness and ease of use (Davis, 1989; Holden & Karsh, 2010); the Andersen Behavioural Model, which highlights enabling resources such as income, education, and access; and the Health Belief Model, which links behaviour to perceived risk, benefits, and self-efficacy. Together, these frameworks show that digital health utilisation is shaped by interacting technological, behavioural, and structural factors.

Despite growing global interest in digital health, most studies focus on access, general digital literacy, or health outcomes, with limited attention to how digital health literacy translates into actual utilisation of digital health resources in everyday decision-making. Moreover, empirical evidence from Cameroon and similar low-resource settings remains limited.

Against this background, this study examines the relationship between digital health literacy and digital health resource utilisation among adults in Bamenda, Cameroon. It further explores whether individuals with higher DHL are more likely to engage with online health searches, mobile health applications, telemedicine services, and social media health content. By focusing on actual utilisation rather than access alone, the study contributes to a more precise understanding of digital health behaviour in resource-constrained settings.

The findings are expected to inform digital health policy, health communication strategies, and health system strengthening by highlighting the importance of not only expanding infrastructure but also improving the literacy required for meaningful engagement with digital health systems.

LITERATURE REVIEW AND THEORETICAL FRAMEWORK

Digital health literacy (DHL) has emerged as a critical determinant of health system engagement in increasingly digitalised healthcare environments. It extends traditional health literacy by incorporating the competencies required to access, understand, evaluate, and apply health information obtained from digital platforms for informed decision-making. Norman and Skinner (2006) define eHealth literacy as the ability to seek, locate, comprehend, and appraise electronic health information and apply it to solve health-related problems. This definition underscores DHL as a multidimensional construct that integrates cognitive, behavioural, and evaluative capabilities rather than merely technical digital skills.

Contemporary literature further conceptualises DHL as a composite of multiple literacies, including information, media, computer, scientific, and health literacy (van der Vaart & Drossaert, 2017; Griebel et al., 2018). Within this framing, DHL is not only an individual capability but also a structural determinant of how effectively individuals interpret and translate digital health information into actionable health decisions. Consequently, DHL has been widely recognised as a key predictor of digital health engagement and behavioural translation in modern health systems (Arias López et al., 2023).

Empirical evidence consistently demonstrates a positive association between digital health literacy and engagement with digital health resources. Individuals with higher DHL are more likely to engage in online health information seeking, use mobile health applications, participate in telemedicine services, and interact with social media-based health content (Yuen et al., 2024). Fan et al. (2023) further show that digital literacy significantly influences both behavioural intention and actual utilisation of mobile health technologies, reinforcing its role as a strong predictor of real-world digital engagement. Similarly, Kim et al. (2023) report that higher eHealth literacy is associated with improved self-management behaviours and greater use of digital health resources for decision-making. However, despite these associations, utilisation remains uneven, particularly in low- and middle-income countries, where structural barriers such as affordability constraints, limited digital competencies, and trust deficits persist, creating a persistent gap between access and meaningful use.

The digital divide theory provides a critical explanatory lens for these inequalities. Originally focused on access disparities, the concept has evolved to include differences in digital skills, usage patterns, and outcomes (van Dijk, 2020). In health contexts, this divide manifests as unequal engagement with digital health systems across socio-economic, educational, and geographic groups. In sub-Saharan Africa, including Cameroon, structural inequalities such as income disparities, low internet penetration, and uneven educational attainment significantly shape digital engagement. Importantly, high mobile phone ownership has not translated into equivalent levels of functional digital health utilisation, reinforcing the distinction between access and effective use.

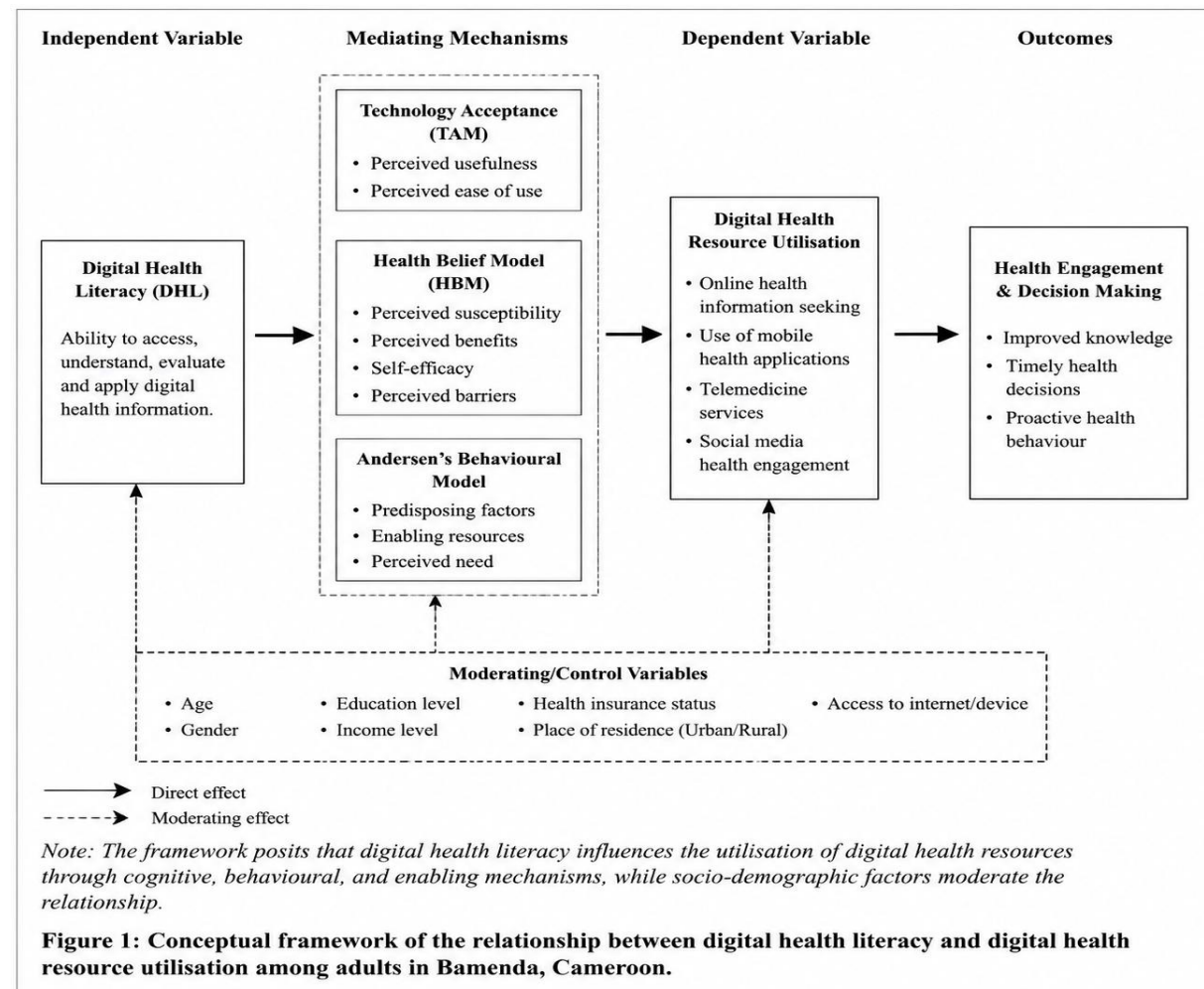
To explain the mechanisms underlying these relationships, this study draws on three complementary theoretical perspectives: the Technology Acceptance Model (TAM), Andersen's Behavioural Model of Health Services Use, and the Health Belief Model (HBM). TAM posits that technology adoption is driven by perceived usefulness and perceived ease of use (Davis, 1989). Within this framework, digital health literacy enhances both perceptions by enabling individuals to better understand and navigate digital platforms, thereby increasing adoption and utilisation (Holden & Karsh, 2010).

Andersen's Behavioural Model conceptualises healthcare utilisation as a function of predisposing characteristics, enabling resources, and perceived need (Andersen, 1995). Within this model, DHL functions as a key enabling resource that facilitates access to digital health systems, while socio-demographic and infrastructural conditions such as income, education, and place of residence determine whether capability translates into actual utilisation.

The Health Belief Model (HBM) further explains health behaviour through perceptions of susceptibility, severity, benefits, barriers, and self-efficacy (Janz & Becker, 1984). DHL strengthens these cognitive processes by improving individuals' ability to interpret health risks, evaluate benefits of action, and develop confidence in health-related decision-making, thereby increasing engagement with digital health resources.

Building on these theoretical perspectives, this study conceptualises digital health utilisation as the outcome of interacting cognitive, behavioural, and structural mechanisms. As illustrated in Figure 1, digital health literacy (DHL) serves as the primary independent variable influencing digital health resource utilisation, which in turn leads to improved health engagement and decision-making outcomes such as enhanced knowledge, timely decisions, and proactive health behaviour.

The relationship between DHL and utilisation is mediated through three theoretical mechanisms. First, TAM explains behavioural adoption through perceived usefulness and ease of use. Second, HBM accounts for motivational and psychological drivers such as perceived risk, benefits, barriers, and self-efficacy. Third, Andersen's model situates utilisation within broader structural and enabling conditions that shape access and sustained engagement.



Importantly, the framework also incorporates moderating and control variables that shape the strength of these relationships. These include age, gender, education level, income, health insurance status, place of residence (urban/rural), and access to internet-enabled devices. As illustrated in Figure 1, these variables do not directly determine utilisation but condition the magnitude of the relationship between DHL and digital health engagement, reflecting structural inequalities in digital health access and use.

Overall, the model positions digital health behaviour as a layered process in which individual capability (DHL), cognitive-behavioural mechanisms (TAM and HBM), and structural conditions (Andersen and digital divide factors) interact to determine actual utilisation and downstream health outcomes.

Despite growing global attention to digital health, most existing studies remain concentrated in high-income settings and focus primarily on access or behavioural intention rather than actual utilisation and preventive health behaviour. Evidence from low- and middle-income countries, particularly Cameroon, remains limited. Furthermore, few studies have jointly examined digital health literacy as a predictor of both digital health resource utilisation and preventive health behaviour within a single integrated behavioural framework.

This study addresses these gaps by empirically examining the relationship between digital health literacy, digital health resource utilisation, and preventive health behaviour among adults in Bamenda, Cameroon, while accounting for socio-demographic moderation effects in a resource-constrained environment.

METHODOLOGY

Research Design

This study employed a quantitative cross-sectional design to examine the relationship between digital health literacy and digital health resource utilisation among adults in Bamenda, Cameroon. The cross-sectional approach is appropriate for identifying associations between variables at a single point in time and is widely applied in behavioural and public health research where the objective is to explain patterns of relationships rather than causal temporal dynamics.

Study Area

The study was conducted in Bamenda, the capital of the Northwest Region of Cameroon. Bamenda is a rapidly urbanising and socio-economically heterogeneous city comprising urban, peri-urban, and rural communities. It serves as a regional healthcare and administrative hub with a mixed health system involving public, private, and faith-based providers. The city presents marked disparities in digital infrastructure and healthcare access, making it a suitable context for examining inequalities in digital health literacy and utilisation.

Study Population

The target population comprised adults aged 18 years and above residing in Bamenda. Adults were selected due to their independent interaction with healthcare systems and digital platforms. Eligibility criteria required a minimum of one year of residence in Bamenda and recent engagement with healthcare services or health information within the past six months. Individuals below 18 years, temporary residents, and those with cognitive or health conditions affecting response reliability were excluded.

Sampling Procedure and Sample Size

An initial sample size of 500 respondents was targeted; however, 437 valid responses were retained after data cleaning and quality checks. A stratified multistage sampling strategy was adopted to ensure representativeness across urban, peri-urban, and rural strata. Communities were first stratified by locality type, followed by random selection of communities within each stratum. Systematic sampling was then applied at the household level, and where multiple eligible respondents were present, simple random selection was used. This approach enhanced representativeness while reducing selection bias.

Data Collection Instrument

Data were collected using a structured questionnaire comprising four sections: socio-demographic characteristics, digital health literacy, digital health resource utilisation, and control variables. Digital health literacy was measured using adapted items from the eHealth Literacy Scale (eHEALS) and the Digital Health Literacy Instrument (DHLI), refined through pre-testing to ensure contextual relevance. Digital health utilisation was operationalised as engagement with online health information, mobile health applications, telemedicine services, and social media health content, measured using Likert-scale items to construct composite indices.

Measurement of Variables

Digital health literacy, the independent variable, was operationalised as a composite index capturing access, understanding, evaluation, and application of digital health information. The dependent variable, digital health resource utilisation, measured both frequency and diversity of engagement with digital health platforms.

Control variables included age, gender, education, income, health insurance status, and place of residence to account for confounding influences.

Validity and Reliability

Instrument validity was ensured through expert review in public health and digital health research, complemented by pilot testing to improve clarity and contextual appropriateness. Reliability was assessed using Cronbach's alpha, with all constructs exceeding the acceptable threshold of 0.70. Construct validity was further confirmed through exploratory factor analysis, ensuring appropriate item loadings on their respective latent constructs.

Data Analysis

Data were analysed using Stata version 16. Descriptive statistics were used to summarise respondent characteristics and variable distributions. Composite indices were constructed for digital health literacy and utilisation. Bivariate analysis was conducted to explore preliminary relationships, followed by multivariate regression models (OLS and ordered logistic regression where appropriate) to estimate the effect of digital health literacy on utilisation while controlling for covariates. Statistical significance was set at $p < 0.05$, and results were reported using coefficients, standard errors, and confidence intervals.

Ethical Considerations

Ethical approval was obtained from relevant institutional authorities prior to data collection. Participation was voluntary, and informed consent was obtained from all respondents. Confidentiality and anonymity were strictly maintained through data anonymisation and secure storage, with access restricted to the research team only.

RESULTS

Descriptive Statistics

The analysis is based on 437 valid responses drawn from adults in Bamenda, Cameroon. Descriptive results indicate moderate levels of digital health literacy (DHL) across the sample, with observable heterogeneity across socio-demographic groups. Digital health resource utilisation similarly reflects moderate engagement, with higher use of general online health searches compared to more structured services such as telemedicine and mobile health applications. Preventive health behaviour also shows variability across respondents, suggesting uneven adoption of proactive health practices within the population.

Effect of Digital Health Literacy on Digital Health Resource Utilisation

Table 1: Effect of Digital Health Literacy on Digital Health Resource Utilisation

Predictor	β (Coefficient)	SE	t-value	p-value
Digital Health Literacy	0.0348***	0.007	5.197	<0.001
Age	-0.0043*	0.002	-2.039	0.042
Education Level	0.1485***	0.031	4.742	<0.001
Income	0.0071	0.025	0.288	0.773
Insurance Status	0.0185	0.054	0.341	0.733

Model Statistics: $R^2 = 0.148$, $F = 15.01$, $N = 437$

Note: *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$

Table 1 presents the OLS regression results examining the effect of digital health literacy on digital health resource utilisation, controlling for socio-demographic characteristics. Digital health literacy exhibits a

positive and statistically significant effect on digital health utilisation ($\beta = 0.0348$, $p < 0.001$), indicating that higher levels of DHL are associated with increased engagement with digital health platforms, including online health information seeking, mobile health applications, and telemedicine services. Among control variables, age has a small but significant negative effect ($\beta = -0.0043$, $p < 0.05$), suggesting reduced digital engagement among older individuals. Education level shows a strong positive association ($\beta = 0.1485$, $p < 0.001$), indicating that higher educational attainment enhances digital health utilisation. Income and insurance status are not statistically significant predictors, highlighting the limited role of financial factors once literacy is accounted for. The model explains a moderate proportion of variance in utilisation ($R^2 = 0.148$), and is statistically significant overall ($F = 15.01$, $p < 0.001$).

Effect of Digital Health Literacy on Preventive Health Behaviour

Table 2: Effect of Digital Health Literacy on Preventive Health Behaviour (OLS Regression)

Predictor	β (Coefficient)	SE	t-value	p-value
Digital Health Literacy	0.710***	0.050	14.200	<0.001
Age	-0.130***	0.030	-4.600	<0.001
Education Level	0.520***	0.080	6.500	<0.001
Income	0.070	0.050	1.400	0.160
Insurance Status	0.040	0.040	1.000	0.310

Model Statistics: $R^2 = 0.440$, F -statistic = significant, $N = 437$

Note: *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$

Table 2 reports results examining the relationship between DHL and preventive health behaviour. Digital health literacy has a strong and highly significant effect on preventive health behaviour ($\beta = 0.710$, $p < 0.001$). This indicates that individuals with higher DHL are substantially more likely to engage in proactive health actions such as early health information seeking, routine health checks, and preventive decision-making. Age is negatively associated with preventive behaviour ($\beta = -0.130$, $p < 0.001$), while education shows a strong positive effect ($\beta = 0.520$, $p < 0.001$). Income and insurance status remain statistically insignificant. The model demonstrates strong explanatory power ($R^2 = 0.44$), indicating robust predictive performance.

These results suggest that DHL is a significantly stronger predictor of preventive health behaviour than of utilisation alone.

Moderation Effects of Socio-Demographic Factors

Table 3: Moderation Effects of Socio-Demographic Factors on Digital Health Utilisation

Predictor	β	p-value
Digital Health Literacy	0.210**	0.030
Age	-0.180***	<0.001
Education Level	0.390***	<0.001
Gender	0.050	0.210
Urban Residence	0.120**	0.040
DHL $\times$ Age	-0.080***	<0.001
DHL $\times$ Education	0.060**	0.020
DHL $\times$ Gender	0.030	0.180
DHL $\times$ Residence	0.090**	0.010

Note: *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$

Table 3 presents moderation analysis assessing whether socio-demographic factors condition the relationship between DHL and digital health resource utilisation. The results indicate that digital health literacy remains a

significant predictor of utilisation ($\beta = 0.210$, $p < 0.05$). Age negatively influences utilisation ($\beta = -0.180$, $p < 0.001$), while education ($\beta = 0.390$, $p < 0.001$) and urban residence ($\beta = 0.120$, $p < 0.05$) significantly enhance digital health engagement. Gender is not statistically significant. Interaction effects further confirm heterogeneous impacts of DHL across population groups. The interaction between DHL and age is negative and highly significant ($\beta = -0.080$, $p < 0.001$), indicating that the positive effect of DHL weakens with increasing age. Conversely, DHL interacts positively with education ($\beta = 0.060$, $p < 0.05$) and place of residence ($\beta = 0.090$, $p < 0.05$), suggesting stronger effects among more educated and urban populations. The interaction with gender is not significant.

Summary of Key Findings

Across all models, three consistent empirical patterns emerge:

Digital health literacy significantly enhances both digital health resource utilisation and preventive health behaviour.

The effect of DHL is substantially stronger for preventive health behaviour than for utilisation outcomes.

The DHL–utilisation relationship is structurally conditioned by age, education, and place of residence, confirming the presence of a digital divide in health engagement.

Income and insurance status do not play a statistically significant role in any model, suggesting that behavioural and cognitive factors are more influential than financial access in determining digital health engagement in this context.

DISCUSSION

This study examined the relationship between digital health literacy (DHL), digital health resource utilisation, and preventive health behaviour among adults in Bamenda, Cameroon. The findings demonstrate that DHL is a significant and consistent predictor of both digital health resource utilisation and preventive health behaviour. However, this relationship is not uniform across population groups, as age, education, and place of residence significantly moderate its effects. In contrast, income and health insurance status do not exhibit statistically significant effects, suggesting that behavioural and cognitive capabilities play a more decisive role than purely financial resources in shaping digital health engagement in this context. These findings are consistent with recent empirical evidence which positions digital health literacy as a central determinant of effective engagement with digital health systems, particularly in low- and middle-income settings where structural inequalities shape digital outcomes (Kim et al., 2023; Fan et al., 2023; Yuen et al., 2024).

The positive relationship between digital health literacy and digital health resource utilisation confirms that individuals with higher digital competencies are more likely to engage with online health information, mobile health applications, telemedicine services, and social media-based health content. This aligns with a growing body of empirical literature demonstrating that digital literacy is a strong predictor of both behavioural intention and actual utilisation of mHealth technologies (Fan et al., 2023; Kim et al., 2023). From a theoretical standpoint, this relationship is well explained by the Technology Acceptance Model (TAM), which posits that perceived usefulness and perceived ease of use are key determinants of technology adoption (Davis, 1989; Holden & Karsh, 2010). In this regard, higher levels of DHL enhance individuals' ability to interpret digital health content, reduce cognitive barriers to navigation, and strengthen perceived value of digital platforms, thereby facilitating actual utilisation.

The non-significant effects of income and insurance status further suggest that financial capacity alone is insufficient to explain digital health engagement in this context. Instead, digital health utilisation appears to be primarily capability-driven rather than resource-constrained, reinforcing recent arguments in the literature that digital engagement is increasingly determined by literacy, skills, and trust rather than economic access alone (van Dijk, 2020; Griebel et al., 2018). This shift underscores the growing importance of cognitive and behavioural determinants in shaping health-related digital behaviours.

A particularly important finding of this study is the strong positive association between digital health literacy and preventive health behaviour. Individuals with higher DHL are more likely to engage in proactive health actions such as early symptom recognition, routine health screening, timely care-seeking, and informed decision-making regarding health risks. This finding is consistent with the Health Belief Model (HBM), which posits that health behaviour is shaped by perceived susceptibility, perceived severity, perceived benefits, perceived barriers, and self-efficacy (Janz & Becker, 1984). In this context, digital health literacy enhances preventive behaviour by strengthening individuals' capacity to interpret health risks, evaluate the benefits of preventive action, and build confidence in health-related decision-making processes. Empirical studies further support this relationship, demonstrating that higher eHealth literacy is associated with improved self-management behaviours and increased engagement in preventive health practices (Arias López et al., 2023; Kim et al., 2023). Notably, the stronger effect of DHL on preventive behaviour compared to utilisation suggests that digital literacy does not merely facilitate engagement with digital platforms but also operates as a behavioural transformation mechanism influencing health decision-making and action.

The moderation analysis further reveals that the relationship between DHL and digital health utilisation is structurally conditioned by socio-demographic factors. Age significantly weakens the effect of DHL, indicating that older individuals derive less benefit from digital competencies in translating them into actual digital health engagement. This finding is consistent with digital divide theory, which identifies age as a persistent barrier to effective digital participation, not only in access but also in meaningful usage and outcomes (van Dijk, 2020). Education, on the other hand, strengthens the effect of DHL, suggesting that formal educational attainment enhances individuals' ability to interpret, evaluate, and apply digital health information effectively. Similarly, urban residence significantly amplifies the impact of DHL, reflecting the role of infrastructure, connectivity, and exposure to digital ecosystems in facilitating effective digital health engagement. Gender, however, does not significantly moderate the relationship, suggesting that once digital health literacy is accounted for, engagement patterns are relatively uniform across males and females in this context.

These findings collectively reinforce the argument that digital health inequalities are no longer solely defined by access but are increasingly shaped by layered disparities in skills, usage intensity, and behavioural outcomes. The digital divide has therefore evolved from a binary access problem into a multidimensional inequality framework encompassing capability, opportunity, and outcome disparities (van Dijk, 2020; Griebel et al., 2018).

The Andersen Behavioural Model provides further explanatory depth for these findings by conceptualising healthcare utilisation as a function of predisposing characteristics, enabling resources, and perceived need (Andersen, 1995). In this study, digital health literacy functions as a key enabling resource that facilitates access to and utilisation of digital health systems. However, the findings demonstrate that enabling resources alone are insufficient to guarantee utilisation, as structural factors such as age, education, and place of residence significantly condition behavioural outcomes. This aligns with broader evidence that healthcare utilisation in digital contexts is strongly shaped by contextual and structural inequalities that mediate the translation of capability into action (Holden & Karsh, 2010; van Dijk, 2020).

From a policy perspective, the findings highlight that expanding digital health infrastructure without simultaneous investment in digital health literacy is unlikely to produce equitable outcomes. Strengthening digital competencies is therefore essential for ensuring meaningful engagement with digital health systems. In addition, targeted interventions are required for older populations, who consistently derive lower benefits from digital competencies, and for rural populations, who face infrastructural constraints that limit the effectiveness of digital engagement. The strong relationship between DHL and preventive health behaviour further suggests that improving digital health literacy may serve as a cost-effective strategy for enhancing preventive health uptake and reducing long-term healthcare burdens in resource-constrained settings.

Overall, this study contributes to the literature by demonstrating that digital health literacy is a powerful but context-dependent determinant of both digital health utilisation and preventive health behaviour. Its effects are shaped by socio-demographic and structural inequalities, reinforcing the need to conceptualise digital health

literacy not as an isolated predictor but as part of a broader socio-technical ecosystem in which literacy, infrastructure, and inequality jointly determine health outcomes.

CONCLUSION

This study demonstrates that digital health literacy is a significant determinant of both digital health resource utilisation and preventive health behaviour among adults in Bamenda, Cameroon, with a stronger effect observed on preventive health outcomes, indicating that digital literacy not only facilitates access to digital health platforms but also enhances proactive health decision-making. However, its impact is not uniform, as age, education, and place of residence significantly moderate this relationship, while income and health insurance are not statistically significant, highlighting the predominance of cognitive and behavioural factors over economic access in shaping digital health engagement. As such, digital health literacy functions as both a behavioural and structural determinant operating within a broader socio-technical system influenced by inequality and infrastructure disparities. Therefore, improving digital health outcomes requires integrated interventions that combine the strengthening of individual digital competencies with structural reforms that address educational gaps, rural–urban disparities, and limited digital infrastructure. Policy efforts should prioritise embedding digital health literacy into national health strategies, implementing targeted training for older adults and low-education populations, integrating digital guidance within healthcare delivery, and expanding community-based digital literacy programmes to ensure equitable and effective use of digital health systems.

Limitations Of The Study

This study is cross-sectional, limiting causal inference. Data were self-reported, which may introduce response bias. The study is geographically limited to Bamenda, restricting generalisability to other regions. Future studies should adopt longitudinal designs and broader geographic coverage.

REFERENCES

1. Andersen, R. M. (1995). Revisiting the behavioral model and access to medical care: Does it matter? *Journal of Health and Social Behavior*, 36(1), 1–10.
2. Arias López, M. P., Ong, B. A., Borrat-Frigola, X., et al. (2023). Digital literacy as a determinant of health: A scoping review. *PLOS Digital Health*, 2(10), e0000279. <https://doi.org/10.1371/journal.pdig.0000279>
3. Centers for Disease Control and Prevention. (2024). Health literacy and eHealth literacy. <https://www.cdc.gov/healthliteracy>
4. Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly*, 13(3), 319–340. <https://doi.org/10.2307/249008>
5. Fan, S., Jain, R. C., & Kankanhalli, M. S. (2023). Factors affecting willingness to use mobile health applications: A behavioral analysis. arXiv preprint arXiv:2305.05962. <https://arxiv.org/abs/2305.05962>
6. Griebel, L., Enwald, H. P. K., Gilstad, H., et al. (2018). eHealth literacy research—A systematic review. *Journal of Medical Internet Research*, 20(1), e8. <https://doi.org/10.2196/jmir.8900>
7. Holden, R. J., & Karsh, B. T. (2010). The Technology Acceptance Model: Its past and future in health care. *Journal of Biomedical Informatics*, 43(1), 159–172. <https://doi.org/10.1016/j.jbi.2009.07.002>
8. Janz, N. K., & Becker, M. H. (1984). The Health Belief Model: A decade later. *Health Education Quarterly*, 11(1), 1–47. <https://doi.org/10.1177/109019818401100101>
9. Kim, K., Shin, S., Kim, S., & Lee, E. (2023). eHealth literacy and health-related behaviors: A systematic review. *Journal of Medical Internet Research*, 25, e40778. <https://doi.org/10.2196/40778>
10. Ministry of Public Health (Cameroon). (2020). National digital health strategic plan 2020–2024. Government of Cameroon.
11. Norman, C. D., & Skinner, H. A. (2006). eHEALS: The eHealth literacy scale. *Journal of Medical Internet Research*, 8(4), e27. <https://doi.org/10.2196/jmir.8.4.e27>
12. Singh, J., & Grønli, T.-M. (2024). Digital health adoption barriers in low-income contexts: Evidence from sub-Saharan Africa. *Journal of Global Health Informatics*, 15(2), 112–124.

13. van der Vaart, R., & Drossaert, C. (2017). Development of the Digital Health Literacy Instrument (DHLI). *Journal of Medical Internet Research*, 19(11), e407. <https://doi.org/10.2196/jmir.8371>
14. van Dijk, J. (2020). *The digital divide*. Polity Press.
15. World Health Organization. (2021). *Global strategy on digital health 2020–2025*. World Health Organization. <https://www.who.int>
16. Yuen, E., Knight, K., & others. (2024). Digital health literacy and engagement with digital health services. *Interactive Journal of Medical Research*, 13, e46888. <https://doi.org/10.2196/46888>

Article Information

Manuscript Type: Original Research Article Word Count: Approximately 4500 words Field: Public Health / Digital Health / Health Systems Research

Declarations

- The authors declare no conflict of interest.
- This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.
- Ethical approval was obtained from relevant institutional authorities.
- Informed consent was obtained from all participants.

State of Data Availability

The dataset supporting the findings of this study is not publicly available due to participant confidentiality and ethical restrictions. However, anonymised data may be made available from the corresponding author upon reasonable request and subject to institutional ethical approval.