DigHealth

Micro-credentials in digital health for Ethiopia and Somalia

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Work Package 2

Deliverable D2.2: Report on Need and Competence Analysis in Ethiopia

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We also deeply appreciate all participants who voluntarily dedicated their time and valuable insights to this study. Their contributions are valuable.

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EXECUTIVE SUMMARY

Background: Telemedicine offers a promising solution to healthcare access challenges in Ethiopia, a country characterized by diverse geography and a dispersed population. This survey investigates Ethiopian healthcare professionals' current knowledge, attitudes, and perceived barriers regarding telemedicine to inform effective implementation and expansion within the national healthcare system.

Methods: A needs assessment for the Erasmus+ "DigHealth" project was conducted in Ethiopia from April 1 to May 20, 2025, surveying 90 healthcare professionals from various institutions to evaluate their awareness, usage, and readiness for telemedicine with 87.8% response rate—valid response is 79 participants. An 84-question online Qualtrics questionnaire covered demographics, digital literacy, telemedicine usage, perceptions, and training preferences, with data analyzed using descriptive statistics and presented in various formats.

Key findings: A survey of Ethiopian healthcare professionals revealed that respondents were predominantly male (68%), with an average age of 33.7 years and 8.9 years of clinical experience; 40% held bachelor's degrees and worked across diverse institutional affiliations. Regarding telemedicine, 55% had prior experience, and 70% demonstrated at least some understanding, with perceived benefits including improved access to specialists (68%), reduced patient travel time (62%), and remote staff training (58%). However, significant barriers identified were lack of infrastructure (64%), poor internet connectivity (60%), and limited funding (52%). A strong interest in further telemedicine training was evident, with 82% expressing interest, preferring online self-paced modules (50%) and blended workshops (35%), and desiring training topics such as platform setup (60%) and data privacy/security (55%).

Conclusion: Ethiopian healthcare professionals are keen on telemedicine, recognizing its potential to boost healthcare access despite infrastructure challenges. To advance this, we recommend: developing microcredentials in telemedicine and data security, expanding rural broadband via public-private partnerships, creating national telemedicine guidelines, and implementing "train-the-trainer" programs for educators.

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1 INTRODUCTION

Ethiopia's health professional ratios critically lag behind World Health Organization (WHO) recommendations. While WHO suggests 2.5 to 4.45 skilled health workers per 1,000 people, Ethiopia currently has 0.8-1.63 per 1,000 overall, with just 0.17 physicians per 1,000 and 0.23 midwives per 1,000, revealing a severe shortage compared to global benchmarks (1). The COVID-19 pandemic further exposed these vulnerabilities, leading to the interruption of 68% of national health services according to a WHO 2022 report (2).

Ethiopia tried to reach communities living in remote areas using telecommunication in 1980, which was aimed to close the gap between periphery and center communities (3). Telemedicine presents a strategic solution to bridge urban-rural healthcare disparities by facilitating remote specialist consultations, reducing patient travel costs and wait times, and alleviating the strain on weak referral systems (4). It also offers opportunities for ongoing professional development in remote areas through virtual training (5). Despite its potential, telemedicine adoption in Ethiopia is in its early stages due to insufficient policies, limited equipment, unreliable internet access, and a lack of standardized training (6).

Therefore this need assessment survey, undertaken as part of the Erasmus+ ―DigHealth‖ project, aims to assess current telemedicine awareness, usage, and readiness among Ethiopian healthcare professionals. It also seeks to characterize the benefits, barriers, and training needs to inform curriculum design and offer recommendations for micro-credentials and capacity-building to accelerate telemedicine integration. The findings will specifically guide the development of three micro-credentials—"Telemedicine Foundations," "Digital Health Security," and "Teleconsultation Skills"—which will be piloted at Bule Hora University, Jigjiga University, and Addis Ababa University.

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2. METHODOLOGY

2.1 Study setting and period

A needs assessment was conducted in Ethiopia from April 1 to May 20, 2025, as part of the Erasmus+ "DigHealth" project. This assessment aimed to evaluate the current awareness, usage, and readiness of Ethiopian healthcare professionals to use telemedicine.

2.2 Target population

The target population for this study comprised all health professionals. A needs assessment survey was administered to a sample of 90 healthcare professionals affiliated with public/private hospitals, government departments, NGOs, and academic institutions in Ethiopia.

2.3 Survey Instrument and procedure

An online qualtrics questionnaire from deployed via university mailing lists and professional associations. Eighty-four (84) questions cover demographics, digital literacy, telemedicine usage, perceptions (benefits/barriers), and training preferences. Skip logic ensured relevance; open-ended fields captured qualitative feedback.

2.4 Data Cleaning and analysis

Descriptive statistics were precisely utilized to summarize and characterize the fundamental features of the dataset, providing a clear and concise overview. The valid response is 79 participants in Ethiopia, 87.8% of the response rate. The data were analyzed via descriptive data analysis method. This involved computing measures of central tendency (frequency, and mean) along with measures of variability. The data were presented in tables, graphs, charts, and texts.

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3. RESULTS

3.1 Demographic characteristics of participants

Age of participants

Figure 1 shows that most participants' age, 50.6%, lies between 30 and 39, followed by 20-29 years old—31.6%. The mean age of the participants is 33.7. That shows most participants are of working age and hence, they are eager to learn new technology and digital health in Ethiopia.

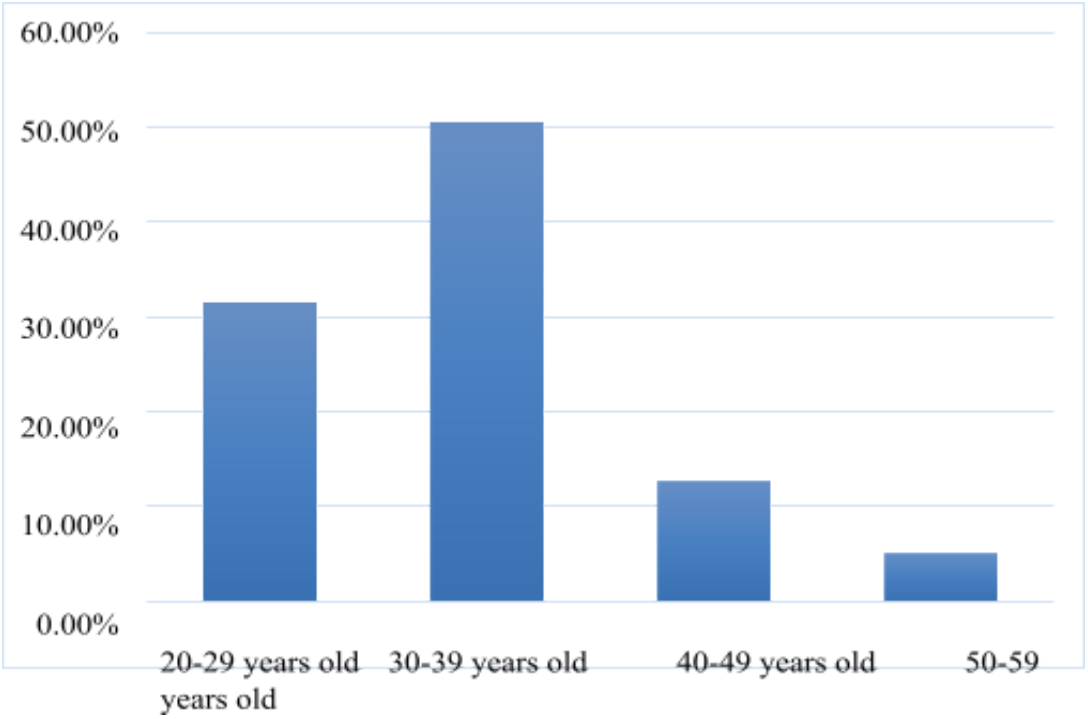

Figure 1: Participants distribution by age

Gender compositions

Table 1 Participants distributed by gender

Gender	Frequency	Percentage
Male	54	68%
Female	25	32%
Total	79	100

As demonstrated in Table 1, 68% of the participants are male workers. Indeed, male health

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professionals are dominant in Ethiopia since they have more access to education and joined

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health sciences education, particularly medical doctors. On the other hand, female participants account for 32%.

Educational background

In Ethiopia, health professionals have a diversified educational background that varies from certificate to Ph.D. Figure 2 shows that 40% of health professionals are bachelor's degree holders. And about 35% of health professionals are master's degree holders whereas 20% are Ph.D. and medical doctors. Only 5% of the participants are diploma/certificate holders. Consequently, they can easily adapt to digital health and provide services to patients with lower effectively and efficiently.

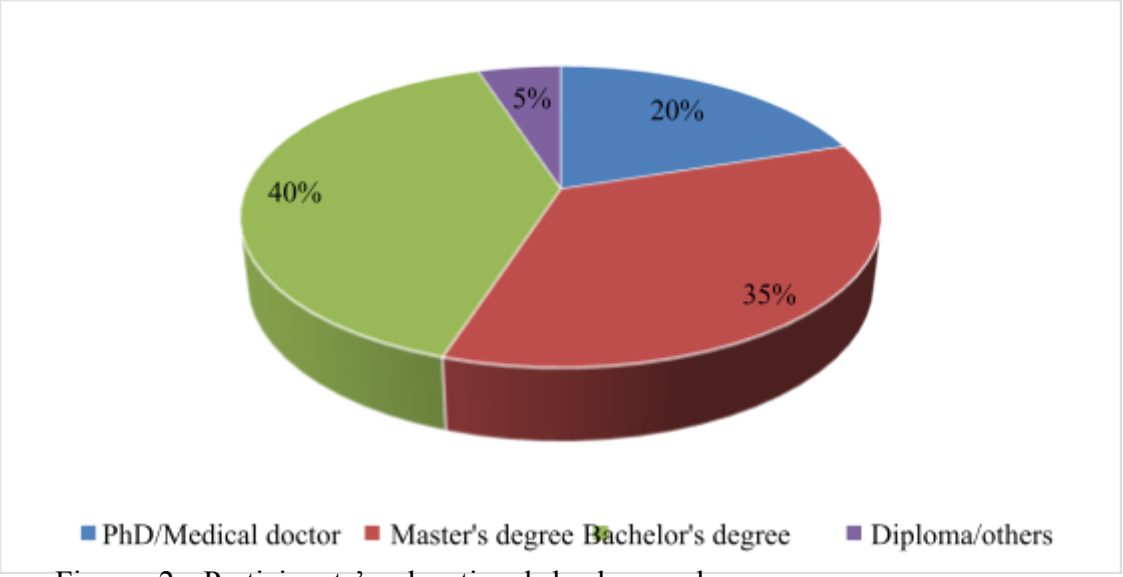

Figure 2: Participants' educational background

Institutional affiliation of participants

The surveyed participants work in different institutions. An attempt was made to include the views of health professionals who work in different institutions. As indicated in Figure 3, most participants, 45%, work in public institutions (health stations, clinics, and hospitals). Further, 30% of participants work in private institutions (clinics and hospitals). These participants work in big cities like Addis Ababa, Adama, Bahir Dar, Hawassa, and Mekele since private health centers usually operate in big cities, where they provide services for densely populated areas.

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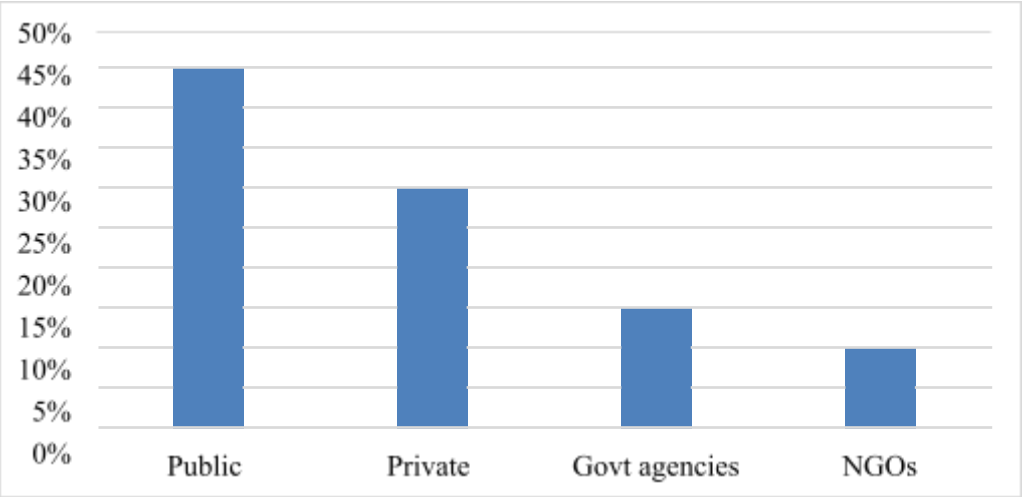

Figure 3: Institutional affiliation of participants

Work experience of participants

Regarding work experience, 38% of participants have 6-10 years of working experience whereas 35% of participants work for 1-5 years in their fields as indicated in Figure 4. Also, the mean work experience of participants is 8.9. This shows that they can easily use digital health if training is given to them

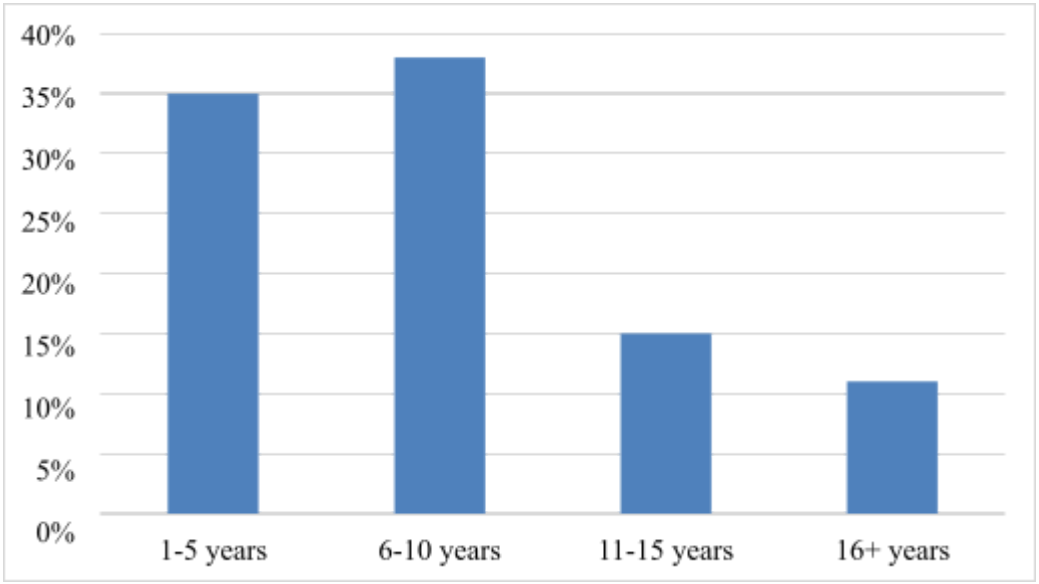

Figure 4: Work experience of participants in the health sector

3.2 Telemedicine Practices in Ethiopia

As described in Table 2, about 54% of participants have prior experience with telemedicine which might simply be the digital health project implementation. On the other hand, 46% of

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participants have no prior experience with telemedicine. These participants require intensive training to implement digital health.

Table 2: Prior experience of participants with telemedicine

Focused areas	Options	Frequency	Percentage
Prior experience with telemedicine	Yes	43	54%
	No	36	46%
	Total	79	100

3.3 Knowledge of Telemedicine

As pointed out in Figure 5, 25% of participants have sufficient knowledge about telemedicine whereas 44% of participants have moderate knowledge of telemedicine. Only 12% of participants do not know about it. These participants are professionals who work in remote areas where information cannot be reached easily.

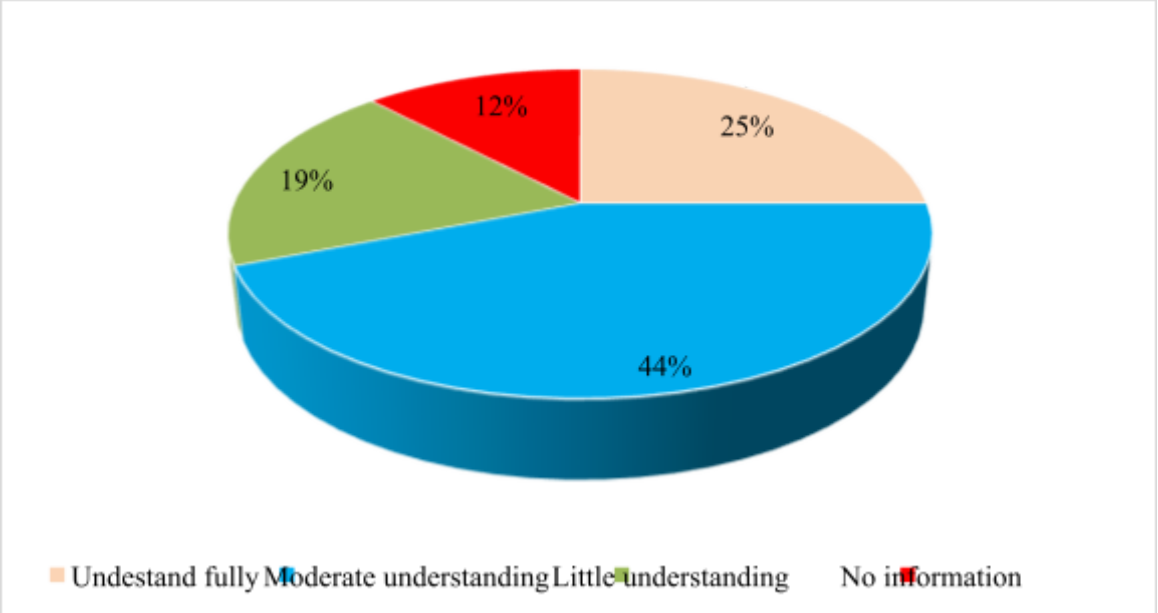

Figure 5: Levels of participants' knowledge of telemedicine

3.4 Perception of participants about telemedicine

Benefits of using telemedicine

Given multiple alternatives (as pointed out in Figure 6), 68% of participants responded that telemedicine improved access to specialists in rural areas where health facilities are poor in

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Ethiopia. Also, 62% of participants replied that telemedicine saved patient travel time/cost, whereas 58% of participants responded that it assisted remote training for healthcare staff. Further, it ensures continuity of care during crises as 54% of participants answered. Additionally, 49% of participants replied that it reduced overcrowding (congesting) in referral hospitals whereas 41% of participants replied that it managed chronic disease.

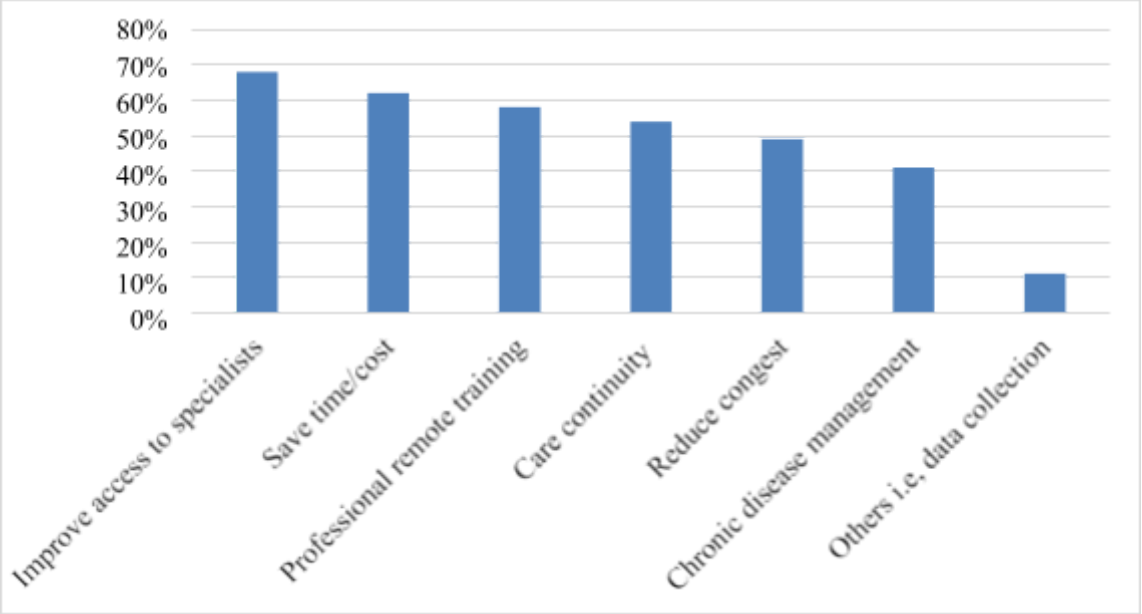

Figure 6: Participants perceived benefits of using telemedicine

Perceived Barriers to Telemedicine

This study's findings revealed that the barriers to telemedicine in Ethiopia are lack of reliable internet/connectivity (63%), insufficient digital infrastructure (equipment) (61%), limited funding/budget constraints (52%), lack of standardized policies/guidelines (49%), and low digital literacy among staff (48%) (as described in Figure 7).

Besides, one of the participants (Physician) replied that *"We have frequent power outages and unreliable internet—no stable network for video consults*." (Physician, Summer 2025).

A nurse added that "*Rural health centers have no broadband; mobile data is too slow and expensive."* (Nurse, Amhara Region).

Regarding budget allocation, a hospital Administrator in Addis Ababa explained that *"No budget allocation for telemedicine equipment—everything depends on donor grants."* (Hospital Administrator, Addis Ababa).

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One of the policy analysts at the Ministry of Health further illustrated that *"Healthcare is already underfunded; difficult to convince policymakers to invest in telehealth."* (Policy Analyst, MoH).

Additionally, concerns about data privacy/security (38%), resistance to change among older clinicians (32%), language or cultural barriers (19 %), legal/regulatory uncertainty (15 %), and patient hesitancy or low trust in remote care (13%) are barriers to telemedicine. Also, one of the Somali Region pharmacists elucidated that "*No official guidelines on telemedicine ethics, licensing, or reimbursement—uncertainty is huge."* (Pharmacist, Somali Region).

Regarding change resistance from staff, the Oromia Health Officer asserted that "*Most staff have never operated a telemedicine platform; we need hands-on training first."* (Health Officer, Oromia). Clinician Educator from the Southern Region added that *"Senior clinicians are resistant; they feel in-person care is the only acceptable standard."* (Clinician Educator, Southern Region).

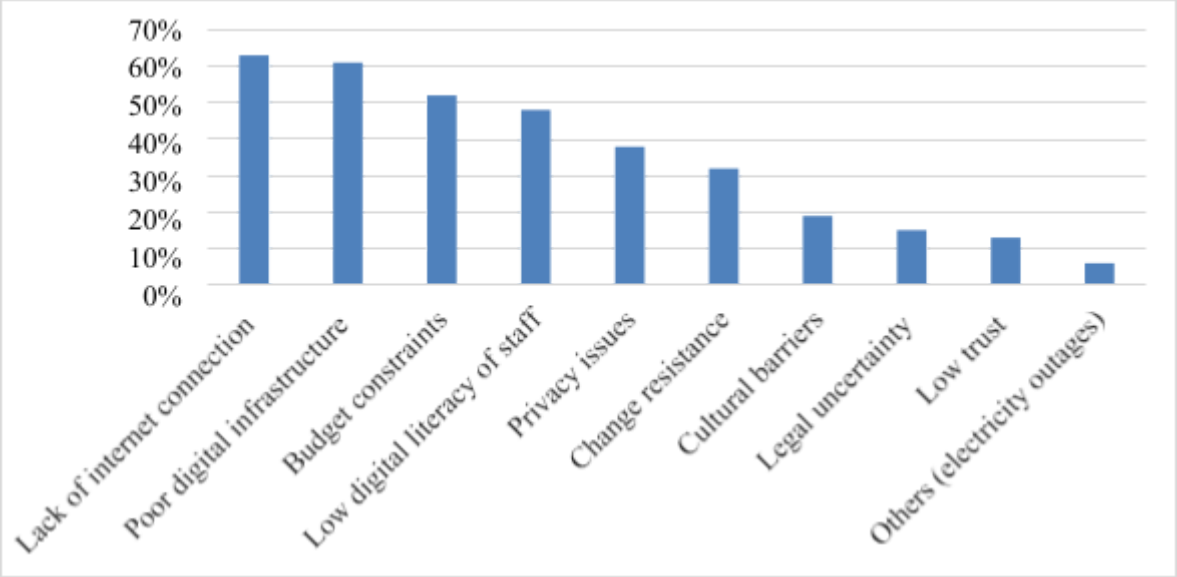

Figure 7: Participants perceived barriers of using telemedicine

Interest in future telemedicine training involvement

Though several factors affect telemedicine implementation in Ethiopia, most health professionals have an interest in engaging in future telemedicine training. Figure 8 shows that 61% of health professionals have a high interest in being trained in telemedicine. Also, 21% of participants showed a willingness to take training on telemedicine.

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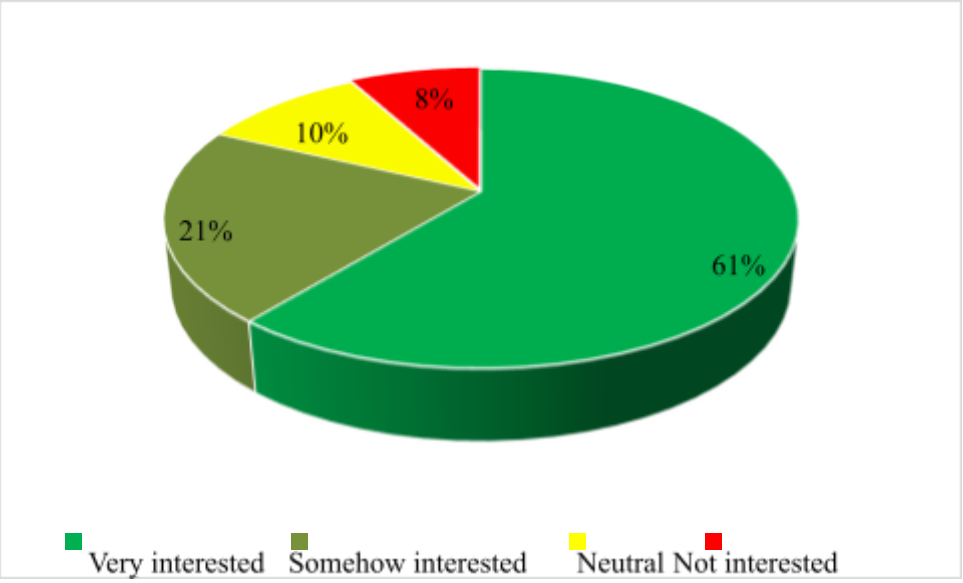

Figure 8: Health professionals' interest in future telemedicine training

Preferred Training Modes and Topics

Regarding training modalities, 51% of participants prefer online self-based modalities whereas 35% aspire to take training via blended workshop since it combines both in-person and online training. On the other hand, only 14% of participants have shown interest in taking training on-site on telemedicine in Ethiopia as described in Figure 9. Generally, most participants, more than 85%, aspire to take telemedicine training online and blended workshops that can easily reach several health professionals in Ethiopia.

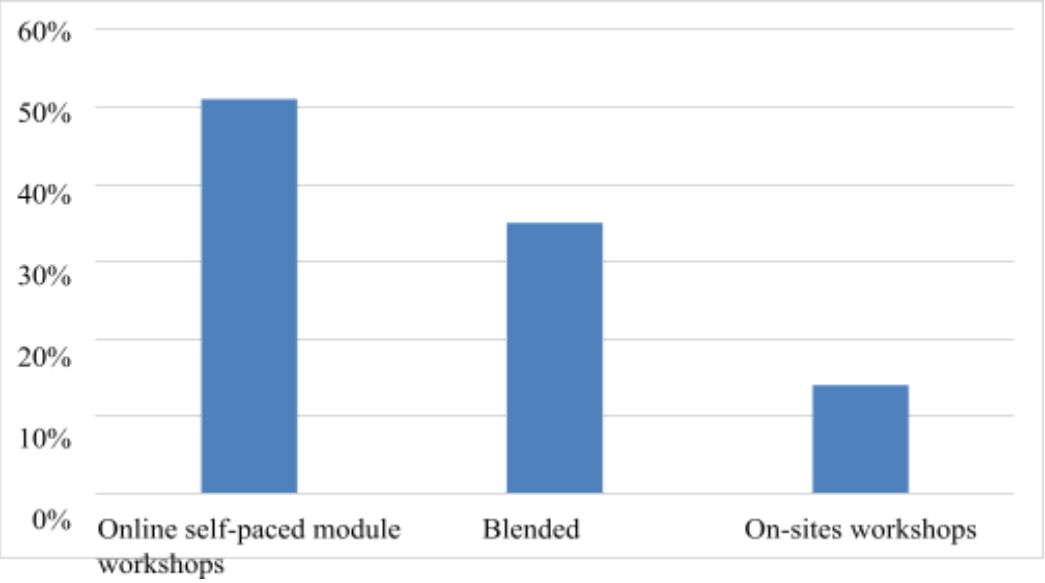

Figure 9: Telemedicine training modalities

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On the other hand, 60% of participants want to take training on telemedicine platform setup and use followed by data privacy, security& ethics (55%). Further, 51% of participants prefer to be trained on teleconsultation best practices whereas 46% of participants want to be trained on remote diagnostics (teleradiology, and tele-labs) as indicated in Table 3. Generally, telemedicine training topics are multiple and require several areas to increase the knowledge, skills, know-how, and expertise of health professionals on telemedicine in Ethiopia.

Table 3 Desired topics for telemedicine training (multiple responses)

Desired areas	**Frequency**	**(%)**
Telemedicine platform setup and use	47	60
Data privacy, security& ethics	43	55
Teleconsultation best practices	40	51
Remote diagnostics (teleradiology, tele-labs)	36	46
Mobile health (mHealth) apps integration	30	38
Clinical workflow integration	28	35
Monitoring and evaluation of telemedicine services	22	28
Billing, reimbursement, and legal aspects	18	23
Cultural competence in virtual care	12	15
Others (AI in telehealth)	7	9

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4. DISCUSSION

Ethiopia's telemedicine scene shows a fascinating contrast: moderate reported exposure but very high willingness to use it. Over half (54%) of Ethiopians have some telemedicine experience, often through informal channels like phone consultations with local providers or seeking advice via social media. This "informal" use highlights a practical approach to overcoming healthcare access issues, especially in rural areas (7). It also mirrors the broader trend in Ethiopia of relying on various healthcare providers, some unregulated, due to a shortage of formally trained medical professionals (8, 9). Despite known systemic barriers to telemedicine adoption in Ethiopia, a significant 82% of the population shows strong interest in further telemedicine training. This highlights a high demand for formalized telemedicine services, suggesting that Ethiopians recognize the substantial benefits, like improved access to care and reduced costs, outweighing the challenges (10). A recent study in Southern Ethiopia (6) found healthcare professionals had a positive attitude towards telemedicine (54.1%) but low actual practice (26%). Our findings show the general population shares this readiness. This "latent demand" presents a clear opportunity for the Ministry of Health and stakeholders to implement targeted interventions: expand internet, develop user-friendly platforms, establish training, and integrate informal practices into a national telemedicine strategy to address healthcare disparities and improve outcomes.

In our survey healthcare professionals show a significant gap in telemedicine understanding. Only a quarter (25%) fully grasp it, while nearly a third (31%) have limited or no understanding. This disparity necessitates a multi-tiered educational approach, moving beyond a one-size-fits-all model to offer foundational training for novices and advanced instruction for those with some existing comprehension. This aligns with existing literature emphasizing the importance of tailored training programs for effective technology adoption in healthcare (11). Without such targeted interventions, the potential of telemedicine to improve healthcare access and efficiency will remain unrealized for a significant portion of the workforce. The identified infrastructural barriers – unreliable internet (63%), lack of digital infrastructure (61%), and funding constraints (52%) – resonate strongly with global challenges in telemedicine implementation, particularly in developing regions. These findings are consistent with numerous studies highlighting internet connectivity and digital literacy as primary impediments to telehealth expansion (3, 12, 13, and 14).

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Our survey reveals a critical connection between healthcare professionals' demand for practical telemedicine training and the structural realities of public health institutions. The strong interest in applied training – specifically in telemedicine platforms (60%), data privacy and ethics (55%), and teleconsultation skills (51%) – underscores a pervasive recognition among healthcare professionals that theoretical knowledge alone is insufficient for effective telemedicine utilization. This finding aligns with global trends emphasizing the need for practical digital health competencies to bridge the gap between technological potential and real-world application (15). The prioritization of data privacy and ethics is particularly pertinent, given the sensitive nature of patient information and the increasing regulatory scrutiny surrounding digital health, further highlighting the need for comprehensive, evidence-based training programs that move beyond basic technical instruction to encompass the crucial aspects of secure and ethical practice.

Public institutions, accounting for 60% of respondents, are leading telemedicine adoption despite significant infrastructure and human resource limitations. This paradox is common in low- and middle-income countries (LMICs) like Ethiopia, where enthusiasm for digital health often exceeds the foundational resources available (16, 17). In Ethiopia, telemedicine offers a vital solution to healthcare access issues, especially in rural areas hampered by poor transportation, difficult terrain, and specialist shortages. However, its widespread adoption is directly constrained by insufficient internet, lack of equipment, and shortages of skilled human resources (16). There's a significant deficit between the current workforce and the estimated need for multidisciplinary HIS professionals by 2030 (18). This suggests a critical shortage that could impede the effective functioning and development of the country's health information systems.

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5. SURVEY LIMITATIONS

The survey has three main methodological limitations:

- **Self-selection bias:** More digitally engaged individuals are likely to participate in online surveys, skewing results and potentially overestimating digital engagement and access in the general population.
- **Underrepresentation of poor connectivity regions:** The reliance on digital platforms for the survey excludes areas with limited or no internet access, omitting the perspectives of digitally disadvantaged populations.
- **Small response rate:** A low response rate limits the generalizability of findings, as the small, potentially unrepresentative sample prevents confident extrapolation of results to the wider population.

These limitations are crucial to consider when interpreting the survey's findings and designing future research for a more accurate understanding of digital engagement and connectivity.

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6. CONCLUSIONS AND RECOMMENDATIONS

6.1 Conclusion

The findings of this country report highlight that Ethiopia is at a critical juncture in the development and institutionalization of telemedicine. While only a little over half of surveyed professionals (54%) have prior telemedicine experience, there is strong receptivity to learning, coupled with a growing awareness of its value—particularly in improving access, continuity of care, and system efficiency.

The majority of respondents work in public institutions and are relatively young, digitally aware, and open to new service delivery models. This creates an ideal foundation for the targeted expansion of telemedicine, provided systemic challenges—chiefly internet access, infrastructure gaps, and policy voids—are addressed with urgency and coordination.

The high level of expressed interest in further training (over 80%), with a preference for modular, applied, and online-friendly content, aligns well with the goals of the DigHealth project. Micro-credentials tailored to Ethiopia's needs will not only fill individual skill gaps but can also support institutional maturity and national health reform goals.

6.2 Recommendations

Based on the findings of the surveys, the following strategic recommendations were suggested.

Recommendation 1: Develop tiered micro-credentials with a practical focus

Three modular micro-credentials should be developed to address the needs revealed in the survey:

- *Telemedicine Foundations* – for broad introduction and orientation
- *Data Privacy and Digital Ethics* – to respond to high concern over security and trust
- *Teleconsultation Skills*–with simulation-based training for clinical interaction.

These should be offered via blended delivery models—primarily online, with optional in-person workshops for hands-on practice.

Recommendation 2: Invest in connectivity and device access for key pilot sites

Selection of 2–3 university–hospital pairs for early rollout should be prioritized. At each site, ensure stable broadband (>5 Mbps), access to dedicated devices (e.g. tablets or laptops), and

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provision of power backups (e.g. solar or UPS). These environments can serve as Telemedicine Demonstration Hubs.

Recommendation 3: Embed telemedicine into clinical and academic curricula

Work with partner institutions (e.g., Addis Ababa University, Bule Hora University, Jigjiga University) to integrate short modules or electives into undergraduate medical, nursing, and health sciences programs. This will ensure long-term sustainability beyond project funding.

Recommendation 4: Support a national task force on telemedicine guidelines

The Ministry of Health should form a working group (involving academia, ICT providers, clinicians, and regulators) to publish clear national standards for telemedicine licensing, supervision, reimbursement, and data handling.

Recommendation 5: Launch a 'Train-the-Trainer' Cohort

Select and certify 15–20 educators from partner institutions in digital health instruction, simulation facilitation, and local adaptation of the micro-credential content. This cadre will ensure the quality scaling of the program nationwide.

Finally, three micro-credentials **(15 credit points each)** are proposed based on survey findings.

Micro-credential Title	Module Summary	Target Audience
1. Telemedicine Foundations (5 credits)	Overview of telemedicine concepts, history, telehealth vs. telemedicine taxonomy, and key use cases (ICU, teleradiology).	Junior clinicians, health officers, nurses.
2. e-Health Data Privacy & Security (5 credits)	Fundamentals of data encryption, secure communication protocols, patient consent, and national/international regulations.	IT staff, hospital administrators, and clinicians.
3. Teleconsultation Skills (5 credits)	Best practices for remote physical exams, communication skills in virtual settings, cultural competence, and documentation.	Clinical staff (physicians, nurses, pharmacists).

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7. REFERENCES

1. Ministry of Health, Ethiopia. Fact Sheets. Available from: https://www.moh.gov.et/en/fact-sheets
2. World Health Organization Regional Office for Africa. WHO Ethiopia Annual Report 2022. 2023 Jul. Available from: https://www.afro.who.int/sites/default/files/2023-07/WHO%20Ethiopia%20Annual%20Report%202022.pdf
3. Onsongo S, Kagotho E. Telemedicine in Africa: Applications, Opportunities, and Challenges [Internet]. Biomedical Engineering. IntechOpen; 2024. Available from: http://dx.doi.org/10.5772/intechopen.1005094.
4. World Health Organization. Telemedicine: opportunities and developments in Member States: report on the second global survey on eHealth. Geneva: World Health Organization; 2010. Available from: https://iris.who.int/handle/10665/44497
5. Dockweiler, C., and C. Hornberg. ―Knowledge and Attitudes As Influencing Factors For Adopting Health Care Technology Among Medical Students in Germany‖. *Journal of the International Society for Telemedicine and EHealth*, Vol. 2, no. 1, Dec. 2014, pp. 64-70, https://journals.ukzn.ac.za/index.php/JISfTeH/article/view/78
6. Fikrie A, Daniel D, Ermiyas S, Hassen H, Seyoum W, Kebede S, Wako WG. The magnitude of telemedicine utilization and associated factors among health professionals working at selected public hospitals in Southern Ethiopia. PLoS One. 2025 Jan 3;20(1):e0311956. Doi: 10.1371/journal.pone.0311956. PMID: 39752509; PMCID: PMC11698327.
7. International Trade Administration. Healthcare Industry in Ethiopia. 2024. Available from: https://www.trade.gov/country-commercial-guides/ethiopia-healthcare-industry
8. Institute of Medicine. High-Quality Care for Everyone: Making Informal Care Visible and Addressing Care Under Extreme Adversity. Washington (DC): National Academies Press (US); 2019 Jan 4. Chapter 6, Health Care Quality in Settings of Extreme Adversity. Available from: https://www.ncbi.nlm.nih.gov/books/NBK535645/
9. Bulcha G, Gutema H, Amenu D, Birhanu Z. Perceived acceptability, barriers, and enablers in implementing mobile phone messaging-based message-framing intervention for improved maternal and newborn care in Jimma Zone, Ethiopia: a qualitative study. BMJ open. 2025 May 1;15(5):e088342.

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10. DocTrePat. Health Challenges in Ethiopia and Solutions. Flaneur - DocTrePat. 2024. [Accessed June 15, 2025]. Available from: https://doctrepat.com/blogs/health-challenges-in-Ethiopia/
11. Ohannessian R, Xavier C, Kassar J, Moussa G, Zoghbi M. Telemedicine training for healthcare professionals: a narrative review. *Journal of Medical Internet Research*. 2020;22(9):e20822.
12. WHO Global Observatory for eHealth. Atlas of eHealth in the Western Pacific Region. Geneva: World Health Organization; 2010.
13. Craig J, Patterson V. Introduction to the practice of telemedicine. *Journal of Telemedicine and Telecare*. 2005;11(S1):3-9.
14. Wamala DS, Augustine K. A meta-analysis of telemedicine success in Africa. J Pathol Inform. 2013 May 30;4:6. Doi: 10.4103/2153-3539.112686. PMID: 23858382; PMCID: PMC3709418.
15. World Health Organization. Creating a Telemedicine-Ready Healthcare Workforce: Training for Healthcare Providers 2025 Jun 5 [cited 2025 Jun 15]. Available from: https://www.who.int/southeastasia/news/events/detail/2025/06/05/south-east-asia-events/creating-a-telemedicine-ready-healthcare-workforce-training-for-healthcare-providers
16. Monlezun DJ, Omutoko L, Oduor P, Kokonya D, Rayel J, Sotomayor C, Girault MI, De los Ríos Uriarte ME, Sinyavskiy O, Aksamit T, Dugani SB. Digitalization of health care in low-and middle-income countries. Bulletin of the World Health Organization. 2024 Dec 3;103(2):148.
17. Kachimanga C, Zaniku HR, Divala TH, Ket JC, Mukherjee JS, Palazuelos D, Kulinkina AV, Abejirinde IOO, Akker TVD. 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 Uhealth 2024;12(1):e55819. doi:10.2196/55819. PMID: 39316427; PMCID: 11462100.
18. Tilahun B, Endehabtu BF, Gashu KD, Mekonnen ZA, Animut N, Belay H, Denboba W, Alemu H, Mohammed M, Abate B. Current and Future Needs for Human Resources for Ethiopia's National Health Information System: Survey and Forecasting Study. JMIR Med Educ. 2022 Apr 12;8(2):e28965. doi: 10.2196/28965. PMID: 35412469; PMCID: PMC9044145.

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8. ANNEXES

8.1 Needs Assessment Survey tool

Section 1: Demographic & Professional Background

1. **Age:**
2. **Gender:**
3. **Highest Educational Qualification:**
4. **Field of Specialization**
5. **Years in Practice:**
6. **Current Work Setting:**
    1. Hospital
    2. Private Clinic
    3. Health Center
7. **Country of Practice:**
   Ethiopia
   Somalia
   Other: _____

Section 2: Attitude of Health Professionals toward Telemedicine

Attributes of Telemedicine Attitude	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Relative Advantage					
1. Facilitate diagnosis and treatment					
2. Increase communication among healthcare Providers					
3. Telemedicine can reduce the number of visits to healthcare centers					
4. Reduce medical errors					
5. Enables me to accomplish my task more quickly					
6. Improve clinical decisions					
7. Provide more comprehensive health care Services					
Compatibility					
1. In my opinion, telemedicine is compatible with all aspects of my work					

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2. Telemedicine is completely compatible with my current situation					
3. I think telemedicine fits well with the way I					

like to work					
4. Using telemedicine fits well into my work style					
Complexity					
1. I believe using telemedicine requires a lot of mental effort					
2. Learning to operate telemedicine is hard for me					
3. I think telemedicine increases staff workload					
4. I think telemedicine creates new responsibilities for staff					
5. In my opinion, telemedicine threatens information confidentiality and patient privacy					
Trialability					
1. I believe trying telemedicine applications is a great opportunity					
2. I do not have to take very much effort to try out telemedicine					
3. I believe, using telemedicine on a trial basis is enough to see what it could do					
4. I would like to try out telemedicine applications before using it					
Observability					
1. I have seen what other hospital staff do with telemedicine technologies					
2. Telemedicine technology is very visible in the hospital where I work					
3. In the hospital, I see telemedicine technology being used for many tasks					
Which specific telemedicine skills do you believe are needed to improve your confidence in using these tools?					
1. Using video consultation tools					
2. Navigating electronic health records remotely					
3. Managing remote monitoring devices					
4. Understanding legal implications					
5. Understanding ethical implications					
6. Communicating effectively in remote settings					

Section 3: Assessing Healthcare Provider Knowledge of Telemedicine

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Question	Options/Response Area
1. What is your profession?	A. Physician B. Nurse C. Allied Health Professional D. Other (Please specify: _____)
2. How many years have you been practicing in healthcare?	_____
3. Which of the following best describes your understanding of telemedicine?	A. I have a strong understanding of telemedicine and its applications. B. I have a basic understanding of telemedicine. C. I have limited knowledge of telemedicine. D. I have no knowledge of telemedicine.
4. Which of the following are potential benefits of telemedicine? (Select all that apply)	A. Increased access to care for patients in remote areas B. Reduced healthcare costs C. Improved patient satisfaction D. Enhanced continuity of care E. Increased efficiency in healthcare delivery F. Better management of chronic conditions G. Other (Please specify: _____)
5. Which of the following are potential challenges of telemedicine? (Select all that apply)	A. Technical difficulties (e.g., internet connectivity) B. Privacy and security concerns C. Reimbursement issues D. Licensure and regulatory barriers E. Difficulty in performing physical examinations F. Patient's lack of access to technology G. Other (Please specify: _____)
6. Are you familiar with the different types of telemedicine? (Select all that apply)	A. Synchronous (real-time video conferencing) B. Asynchronous (store-and-forward) C. Remote patient monitoring D. mHealth (mobile health) E. Other (Please specify: _____)
7. Are you aware of the legal and ethical considerations related to telemedicine practice?	A. Yes B. No C. Somewhat

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8. Do you know where to find information about telemedicine guidelines and the best practices in your region/country?	A. Yes B. No C. Somewhat
9. How comfortable are you using technology for telemedicine consultations?	A. Very Comfortable B. Comfortable C. Neutral D. Uncomfortable E. Very Uncomfortable
10. Do you believe telemedicine can improve healthcare delivery in your community?	A. Yes B. No C. Maybe
11. What are the biggest barriers to the wider adoption of telemedicine in your opinion?	
12. Any other comments or suggestions regarding telemedicine?	

Section 4: Telemedicine Practice

Question	Options/Response Format
1. Have you ever used telemedicine in your practice?	Yes / No
2. If yes, what types of telemedicine services have you used? (Select all that apply)	A. Video consultations B. Phone consultations C. Remote patient monitoring D. Store-and-forward (asynchronous) E. Other (specify)
3. 4. If no, what are the primary reasons for not using telemedicine? (Select all that apply)	A. Lack of training B. Lack of infrastructure C. Patient resistance D. Concerns about privacy/security E. Concerns about reimbursement F. Preference for in-person care G. Other (specify)

Part 3: Key stakeholders

Question	Options/Response Format

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1. Who are the key institutions currently promoting telemedicine in your country?	A. Ministry of Health B. Hospitals and clinics C. NGOs D. Universities E. Private sector/tech companies F. Other: _____
2. Who are the key institutions you would like to be better informed about the potential of telemedicine	A. Ministry of Health B. Hospitals and clinics C. NGOs D. Universities E. Private sector/tech companies F. Other: _____

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QuestionID	Question Text
Q9	1. Facilitate diagnosis and treatment
Q11	2. Increase communication among health care providers
Q12	3. Telemedicine can reduce the number of visits to health care centers
Q13	4. Reduce medical errors
Q14	5. Improve clinical decisions
Q15	6. Telemedicine provides more comprehensive healthcare services
Q16	1. In my opinion, telemedicine is compatible with all aspects of my work
Q17	2. Telemedicine is comparable with my current workflow
Q18	3. Using telemedicine fits well into my work style
Q19	4. There is clear policies and strategies that encourage health providers to practice telemedicine
Q22	1. I believe using telemedicine requires a lot of mental effort
Q23	2. Learning to operate telemedicine is hard for me
Q24	3. I think telemedicine increases staff workload
Q25	4. In my opinion, telemedicine threatens information confidentiality and patient privacy
Q26	5. Cultural and social factors threatens potentials of health providers to use telemedicine
Q27	1. I believe to try telemedicine applications is a great opportunity
Q28	2. I believe, using telemedicine on a trial basis is enough to see what it could do
Q29	3. I would like to try out telemedicine applications before using it
Q32	1. I have seen what other hospital staffs do with telemedicine technologies
Q33	2. Telemedicine technology is very visible in the hospital where I work
Q41	1. Using video consultation tools
Q42	2. Navigating electronic health records remotely
Q43	3. Managing remote monitoring devices
Q44	4. Understanding legal implications
Q45	5. Understanding ethical implications

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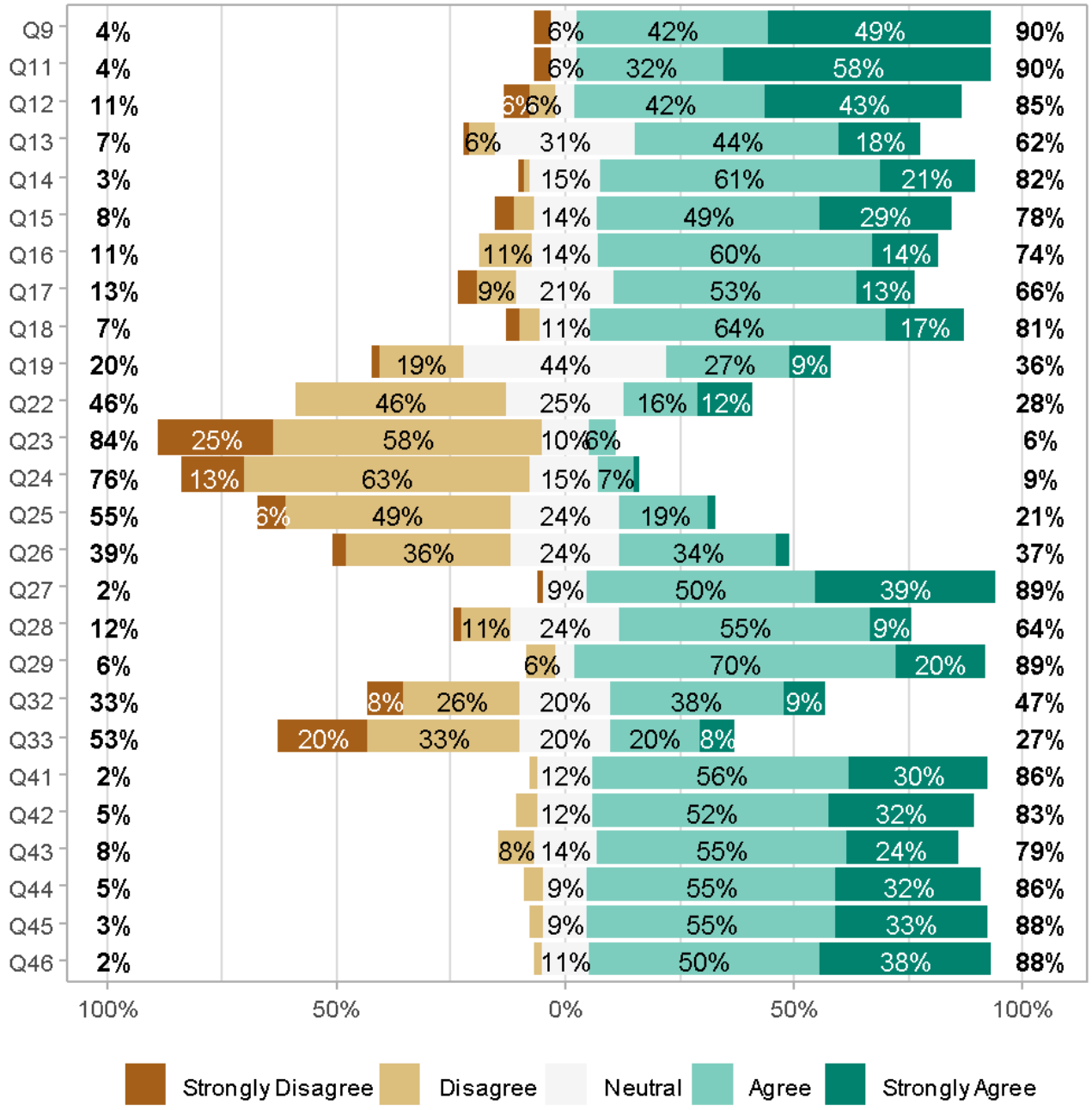
QuestionID	Question Text
Q46	6. Communicating effectively in remote settings



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