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# PERCEPTIONS AND USE OF TELE-NURSING AMONGST NURSES IN THE BAMENDA HEALTH DISTRICT

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## ABSTRACT

**Background:** Tele-nursing is transforming healthcare delivery globally, offering timely and effective care, especially in remote areas. However, its adoption in Sub-Saharan Africa remains critically low due to outdated mindsets and resistance to change among older clinical staff. This underutilization contributes to preventable deaths, particularly in inaccessible regions. Despite proven benefits, many nurses struggle to embrace tele-health because of their training and traditional norms. There is an urgent need to understand and address nurses' perceptions to accelerate tele-nursing integration and reduce healthcare disparities. This study aimed to assess the perceptions and practices in the use of tele-nursing among nurses in the Bamenda Health District. **Methods:** The study targeted nurses working in the Bamenda Health District (Regional Hospital Bamenda, Nkwen District Hospital, and Nkwen Baptist Hospital). Nurses on duty who consented participated, while those not on duty or who declined consent were excluded. A sample size of 100 was determined from a population of 130 using a finite population formula. A 2-stage sampling technique was used where the first phase used the stratified sampling technique to sample the health institutions and the second phase was the convenience sampling, used to sample the study participants. Data was collected via self-administered, structured questionnaires with 23 closed-ended questions across three sections: demographics, perceptions, and use of tele-nursing. The tool was pretested at Azire Integrated Health Center and revised for clarity. Ethical clearance and consent were obtained from relevant authorities and participants. Data was anonymized, securely stored, and analysed using SPSS version 21. Statistical significance was considered when p value was more than or equal to 0.05. **Results:** Out of 100 participants, 66% were female, 40% were aged 20–35, and 36% held degrees. Most had 2–5 years of experience (37%), and 35% each came from the Regional and Baptist Hospitals. A majority (80%) had heard of tele-nursing and 67% had positive perceptions, which were significantly associated with institution, age, and education level ($p < 0.001$). Most (75%) believed tele-nursing improves nursing roles and 76% supported its use across all fields. Regarding practice, 74% had good usage levels, significantly associated with institution ($p < 0.001$), longevity of service ($p = 0.01$), and positive perception ($p < 0.001$). Internet limitations (34%) and heavy workload (40%) were key barriers. **Conclusion:** The study reveals high awareness and positive perceptions of tele-nursing among nurses, with strong associations between perception, practice, and institutional, educational, and experiential factors. Despite good adoption levels, barriers like internet access and workload remain significant challenges.

**KEYWORDS:** Perceptions, Practices, Tele-nursing, Nurses, Bamenda Health District.

## BACKGROUND

Nurses play a vital role in all aspects of healthcare, from recording patient histories and administering treatments to coordinating care and providing community-based services. Their interventions directly impact patient recovery rates, hospital stay durations, and stress levels for both patients and families.[1] With technological advancements, nurses continue to adapt by incorporating digital tools to improve care delivery and management efficiency.[2] Communication, being a central part of nursing, benefits greatly from these advancements, enhancing assessment, treatment, and patient outcomes.[3]

Tele-health has emerged as a transformative solution in healthcare, especially in rural and underserved areas. It enables remote care delivery by leveraging digital technologies, with telenursing focusing on providing nursing services through telecommunication tools.[4] Telenursing supports nurses in offering remote

consultations, patient monitoring, education, and follow-ups.[5] This approach not only broadens access to care but also improves responsiveness, especially in non-urgent cases where patients can be guided or referred to appropriate facilities without delay.[6]

The COVID-19 pandemic significantly accelerated the adoption of tele-health, including telenursing, as it helped reduce physical contact, control virus spread, and ensure continued patient care.[7] Tools like video calls and real-time data transmission became essential in maintaining connections between patients, clinicians, and families.[8] However, these rapid transitions were not without challenges, including increased workloads, adaptation to new technologies, and maintaining effective communication during high-stress periods.[9] The pandemic has forever changed healthcare delivery, making virtual care an integral part of modern health systems.[10]

Despite global progress, tele-nursing remains underutilized in many Sub-Saharan African countries due to traditional beliefs and educational backgrounds that favor in-person care.[1] This limited adoption has contributed to higher mortality rates in remote areas where access to healthcare is restricted.[3] While developed countries have embraced digital health solutions, barriers in Africa include lack of infrastructure, resistance to change, and insufficient training.[10] This study aimed to assess the perceptions and practices in the use of tele-nursing among nurses in the Bamenda Health District.

**METHODS**
This cross-sectional study was conducted among nurses in three health facilities within the Bamenda Health District: The Regional Hospital Bamenda, Nkwen District Hospital, and Nkwen Baptist Hospital which were sampled using the stratified sampling technique. Nurses who were on duty and consented to participate formed the study population, while those absent or unwilling were excluded. Using a finite population correction formula, a sample size of approximately 97 was derived from a total population of 130 nurses. A convenience sampling technique was employed to sample the study participants after sampling the study health areas. Data collection was done using a structured, self-administered questionnaire comprising 23 closed-ended questions grouped into three sections: socio-demographics, perceptions of tele-nursing, and practical use. Prior to deployment, the instrument was pre-tested on 20 nurses at Azire Integrated Health Centre, and adjustments were made for clarity and accuracy. Ethical approval and necessary administrative authorizations were obtained, with informed consent secured from all participants. Anonymity and confidentiality were ensured by securing data on a password-protected computer accessible only to the principal investigator. Data was analyzed using SPSS version 21, and statistical significance was considered if p value was less than or equal to 0.05.

**RESULTS**
**Socio-Demographic Characteristics**
A total of 100(100%) participants took part, most 40(40%) were between 20-35 years. a total of 66(66%) were females. 36(36%) were degree holders. for longevity in service, most 37(37%) had 2-5 years' experience. Most of the participants 35(35%) were from the Regional Hospital Bamenda and the Nkwen Baptist Hospital. (Table 1)

**Table 1: Socio-demographic characteristics of participants.**

| Variable | Characteristics | Frequency(n) | Percentage (%) |
|---|---|---|---|
| Age range | 20-35years | 40 | 40 |
| | 36-45years | 34 | 34 |
| | 46-50years | 20 | 20 |
| | >50years | 6 | 6 |
| | **Total** | **100** | **100.0** |
| Gender | Male | 34 | 34 |
| | Female | 66 | 66 |
| | **Total** | **100** | **100.0** |
| Educational level | Nurse assistant | 15 | 15 |
| | Diploma | 41 | 41 |
| | Degree | 36 | 36 |
| | Master's degree | 8 | 8 |
| | **Total** | **100** | **100.0** |
| Longevity of service | 1year | 18 | 18 |
| | 2-5years | 37 | 37 |
| | 6-10years | 32 | 32 |
| | >10years | 13 | 13 |
| | **Total** | **100** | **100.0** |
| Institution | Regional Hospital Bamenda | 35 | 35 |
| | Nkwen Baptist Hospital | 35 | 35 |

| | Nkwen District Hospital | 30 | 30 |
|---|---|---|---|
| | **Total** | **100** | **100.0** |
| | | | |

**Perceptions of nurses on Tele-Nursing**

A total of 80(80%) accepted they had heard about Tele-nursing. Most 29(29%) heard about it from school. 39(39%) said Tele-nursing is the use of digital and software applications/devices to ensure nursing care. most 47(47%) said access to internet and digital software is essential for tele-nursing. Majority 74(74%) said Tele-nursing is important in clinical practice. Most 44(44%) said tele-nursing is very important. Most 28(28%) said it reduces time consumption. Majority 75(75%) said Tele-nursing improves the effectiveness of nurses' clinical roles. Majority 76(76%) said Tele-nursing should be applied in all fields of nursing practice. Most 34(34%) said tele-nursing is barred by internet limitation. (Table 2).

**Table 2: Participants perceptions on Tele-nursing.**

| Variables | n | % |
|---|---|---|
| **Heard of tele-nursing** | | |
| Yes | 80 | 80 |
| No | 20 | 20 |
| **Source of information on tele-nursing** | | |
| In school | 29 | 29 |
| From the internet | 27 | 27 |
| From colleagues | 10 | 10 |
| Institution | 13 | 13 |
| **Definition of tele-nursing** | | |
| The use of digital and software applications/devices to ensure nursing care | 39 | 39 |
| Calling patients | 17 | 17 |
| Checking on patients after discharge | 29 | 29 |
| The use of phones to contact other health care personnel | 15 | 15 |
| **Essentials in the implementation of tele-nursing** | | |
| Access to the internet and digital software | 47 | 47 |
| Mobile data | 10 | 10 |
| Expertise of digital devices | 24 | 24 |
| Laptops | 19 | 19 |
| **Thinks tele nursing is important in clinical practice** | | |
| Yes | 74 | 74 |
| No | 26 | 26 |
| **Opinion on the level of importance of tele-nursing in nursing practice** | | |
| Not very important | 26 | 26 |
| Somewhat important | 30 | 30 |
| Very Important | 44 | 44 |
| **Perceived impact of tele nursing to patients** | | |
| Improves quality of care | 26 | 26 |
| Reduces time consumption | 28 | 28 |
| Eases consultation and treatment | 20 | 20 |
| It is not important | 26 | 26 |
| **Tele-nursing improves the effectiveness of nurses clinical roles** | | |
| Yes | 75 | 75 |
| No | 25 | 25 |
| **Tele-nursing should be applied in all fields of nursing practice** | | |
| Yes | 76 | 76 |
| No | 24 | 24 |
| **Main disadvantages of tele-nursing** | | |
| Internet limitation | 34 | 34 |
| Lack of confidentiality | 42 | 42 |
| It increases workload | 24 | 24 |

**Overall Perception on Tele-nursing**
Out of the 100(100%) participants that took part in this study, majority 67(67%) had positive perceptions on Tele-nursing while the minority 33(33%) had negative perceptions.

**Table 3: Overall Perception on Tele-nursing.**

| Variables | Characteristics | Frequency (n) | Percentage (%) |
|---|---|---|---|
| Overall Perception | Positive | 67 | 67.0 |
| | Negative | 33 | 33.0 |

**Association between perceptions on Tele-nursing with socio-demographic Characteristics**
The results showed nurses from the Nkwen Baptist hospital, between 20-30 years, who had a master's degree, were most likely to have positive perceptions of Tele-nursing. There was a significant association (P<0.001) with the institution, age ranges and level of education of the nurses with a <0.1% probability of the observation occurring based on chance alone.

**Table 4: Association between perceptions on Tele-nursing with socio-demographic Characteristics.**

| Variables | Characteristics | Positive | Negative | Total n (%) | $X^2$ | *P-Value* |
|---|---|---|---|---|---|---|
| Institution | Regional Hospital Bamenda | 14 | 21 | 35 (35.0) | 24.601 | <0.001* |
| | Nkwen Baptist Hospital | 33 | 2 | 35 (35.0) | | |
| | Nkwen District Hospital | 20 | 10 | 30 (30.0) | | |
| | **Total (%)** | **67 (67.0)** | **33 (33.0)** | **100 (100.0)** | | |
| Age Range | 20-35years | 40 | 0 | 40 (40.0) | 19.110 | <0.001* |
| | 36-45years | 19 | 15 | 34 (34.0) | | |
| | 46-50years | 8 | 12 | 20 (20.0) | | |
| | >50years | 0 | 6 | 6 (6.0) | | |
| | **Total n (%)** | **67 (67.0)** | **67 (33.0)** | **100 (100.0)** | | |
| Level of education | Nurse assistant | 3 | 12 | 15 (15.0) | 22.491 | <0.001* |
| | Diploma | 24 | 17 | 41 (41.0) | | |
| | Degree | 32 | 4 | 36 (36.0) | | |
| | Master's Degree | 8 | 0 | 8 (8.0) | | |
| | Total n (%) | **67 (67.0)** | **67 (33.0)** | **100 (100.0)** | | |

**Practical use of Tele-Nursing**
A total of 80(80%) accepted haven encountered the use of Tele-nursing. Most 67(67%) said it is easy to use. Most 29(29%) said they use it in patient communication. Majority 51(51%) accepted that they are satisfied with the form of Tele-nursing they use. Most 61(61%) denied about interacting with patients on phone after discharge for feedback. Majority 71(71%) said they commonly use of phones. Majority 52(52%) effectively used digital devices for nursing care by consulting colleagues. Most 40(40%) said heavy workload is a limiting factor. (Table 5)

**Table 5: Participants practices in the used of Tele-nursing.**

| Variables | Characteristics | n | % |
|---|---|---|---|
| Encounter the use of Tele nursing before | Yes | 80 | 80 |
| | No | 20 | 20 |
| | **Total** | **100** | **100.0** |
| Tele-nursing easy to use | Yes | 67 | 67 |
| | No | 33 | 33 |
| | **Total** | **100** | **100.0** |
| Circumstances you make use of Tele-nursing | Patient Communication | 29 | 29 |
| | Interacting with colleagues | 20 | 20 |
| | Patient Consultation | 31 | 31 |
| | **Total** | **100** | **100.0** |
| Form of Tele-nursing you make use of | Documentation of patient's information | 29 | 29 |
| | Triage | 21 | 21 |
| | Patient consultation | 15 | 15 |
| | Patient assessment | 15 | 15 |
| | **Total** | **100** | **100.0** |
| Satisfied with the current form of Tele-nursing you use | Yes | 51 | 51 |

|  |  |  |  |
|---|---|---|---|
|  | No | 49 | 49 |
|  | **Total** | **100** | **100.0** |
| Interact with patients on phone after discharge for feedback | Yes | 39 | 39 |
|  | No | 61 | 61 |
|  | **Total** | **100** | **100.0** |
| Digital tool do you commonly make use of | A laptop | 29 | 29 |
|  | Phones | 71 | 71 |
|  | **Total** | **100** | **100.0** |
| How you ensure effective use of digital devices for nursing care | Personal research | 31 | 31 |
|  | Extra Training | 17 | 17 |
|  | Consulting with colleagues | 52 | 52 |
|  | **Total** | **100** | **100.0** |
| Affects the use of digital tools for nursing care | Limited time | 37 | 37 |
|  | Heavy workload | 40 | 40 |
|  | Lack of Knowledge | 33 | 33 |
|  | **Total** | **100** | **100.0** |

**Overall Practice in the use of Tele-nursing**
Out of the 100(100%) participants who took part in this study, majority 74(74%) had overall good practices of Tele-nursing use while the minority.

**Table 6: Overall Practice in the use of Tele-nursing.**

| Variables | Characteristics | Frequency (n) | Percentage (%) |
|---|---|---|---|
| Overall practice | Good | 74 | 74.0 |
|  | Poor | 26 | 26.0 |

**Association between overall practices in the use of Tele-nursing with overall perceptions and longevity of service**
Nurses who were from the Nkwen Baptist hospital and the Nkwen district hospital, who had 2-5 years' work experience and who had overall positive perceptions of Tele-nursing are more likely to have positive perceptions of Tele-nursing. The significant association (P<0.05) with longevity of service and a higher-level significance (P<0.001) with institution and overall perception shows <0.1% probability of the results occurring based on chance alone.

**Table 7: Association between overall practices in the use of Tele-nursing with overall perceptions and longevity of service.**

| Variables | Characteristics | Good | Poor | Total n (%) | $X^2$ | *P-Value* |
|---|---|---|---|---|---|---|
| Institution | Regional Hospital Bamenda | 16 | 19 | 35 (35.0) | 27.119 | <0.001* |
|  | Nkwen Baptist Hospital | 33 | 2 | 35 (35.0) |  |  |
|  | Nkwen District Hospital | 25 | 5 | 30 (30.0) |  |  |
|  | **Total** | **74 (74.0)** | **26 (26.0)** | **100 (100.0)** |  |  |
| Longevity of service | 1year | 10 | 8 | 18 (18.0) | 14.840 | 0.01 |
|  | 2-5years | 33 | 4 | 37 (37.0) |  |  |
|  | 6-10years | 25 | 7 | 32 (32.0) |  |  |
|  | >10years | 6 | 7 | 13 (13.0) |  |  |
|  | **Total** | **74 (74.0)** | **26 (26.0)** | **100 (100.0)** |  |  |
| Overall Perception | Positive | 60 | 7 | 67 (67.0) | 24.763 | <0.001* |
|  | Negative | 14 | 19 | 33 (33.0) |  |  |
|  | **Total n (%)** | **74 (74.0)** | **26 (26.0)** | **100 (100.0)** |  |  |

**DISCUSSION**
The study involved 100 nurses (100%) from selected health facilities within the Bamenda Health District. Participants' ages ranged from 20 to over 50 years, with the highest proportion 34(34%) aged between 36–45 years. Both sexes were represented, though females constituted the majority at 66(66%). Educational qualifications spanned from Nursing Assistants to Master's degree holders, with most 41(41%) being diploma holders (State Registered Nurses, Higher National Diplomas, and Health Personnel Diplomas). Work experience ranged from less than one year to over ten years, with 37(37%) having between 2–5 years of experience. Regarding workplace distribution, most nurses 35(35%) were employed at either the Regional

Hospital Bamenda or the Nkwen District Hospital, demonstrating a balanced institutional representation.

Findings indicated that 67(67%) of participants exhibited a positive perception toward tele-nursing. This aligns with previous findings where 60% of nurses expressed positive attitudes, possibly linked to their prior exposure or orientation on tele-nursing.[11] A substantial proportion 80(80%) had heard about tele-nursing, primarily through academic settings, particularly 29(29%) during their formal education. This reflects results from a study in which 70% of participants were introduced to tele-nursing in school.[12] Notably, 39(39%) correctly defined tele-nursing as the use of digital platforms or devices to facilitate nursing care, which is in concordance with similar definitions identified in prior literature.[13] Furthermore, 47(47%) of respondents acknowledged that internet access is an essential prerequisite for effective tele-nursing, a sentiment echoed by 50% in a prior study.[13]

The majority 74(74%) perceived tele-nursing as a valuable tool in clinical practice, with 44(44%) considering it highly important. These findings are consistent with another study where 50% of participants rated tele-nursing as very important[14] Additionally, 26(26%) believed tele-nursing could enhance the quality of care, which aligns with research that found 40% of nurses agreed tele-nursing improves nursing care.[14] Notably, 75(75%) of respondents agreed that tele-nursing improves the clinical effectiveness of nurses, while 76(76%) advocated for its integration across all domains of nursing. This supports the findings of Vijayalakshmi et al.[15], where 77% recommended incorporating tele-nursing in all nursing specialties. However, the most cited limitation was internet connectivity, identified by 34(34%) of participants, a barrier often related to infrastructural or financial constraints.[16]

Regarding practical application, 74(74%) of participants demonstrated good practices in tele-nursing. This result corroborates previous findings where 67% of nurses showed good tele-nursing practices.[17] A large portion 80(80%) had prior experience using tele-nursing tools, and 67(67%) found these tools user-friendly. These outcomes are consistent with earlier studies in which 65% of nurses reported that tele-nursing platforms were easy to use.[17] The study further revealed that 31(31%) of participants used tele-nursing for patient consultations and 29(29%) for documenting patient information—practices similarly reported by 60% of nurses in another study.[18]

Additionally, 51(51%) of the respondents expressed satisfaction with their current tele-nursing practices, reflecting the findings of McNeil et al.[19], where 70% of participants reported satisfaction with telehealth-supported nursing interventions. Interestingly, 61(61%) did not use phones for follow-up communication, a finding that diverges from prior studies which documented ongoing phone communication with patients' post-discharge.[18] This discrepancy may be attributed to increased nurse workloads or institutional limitations. Lastly, the most commonly used digital tool was the mobile phone, reported by 71(71%) of participants, which is in line with findings from Adeleke et al.[20], where 55% relied primarily on mobile phones. This trend may be due to the accessibility and user familiarity of mobile devices among healthcare workers.

## CONCLUSION
More than half of the nurses had positive perceptions towards Tele-nursing with those from the Nkwen Baptist hospital being the most likely. The perceptions were seen to be significantly associated with the age and level of education.

More than half of the nurses had good practices of Tele-nursing usage which was seen to be significantly associated with their overall perceptions, longevity in service and institutions with nurses at the Nkwen Baptist hospital being the most likely to have good practices.

## Author's Contribution
DMCW, Study conception and design, writing of the manuscript; KAS, Data collection and critical revision of the manuscript; LHS, Study design, supervision of data collection and critical revision of manuscript; TLM/NWEC/KDV, Data analysis and critical revision of manuscript; TLM/WEC, Study design, acquisition and interpretation of data, critical revision of manuscript; TLM/NWEC/KDV, Study conception and design, supervision of data collection and critical revision of manuscript. All authors gave their consent for publication. All authors read and approved the final manuscript.

## Competing Interests
The authors declare that they have no competing interests.

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