KNOWLEDGE ON DIGITAL HEALTH AND ITS ASSOCIATED FACTORS AMONG UNDERGRADUATE PUBLIC HEALTH STUDENTS OF NEPAL

SUBMITTED BY:

DIPESH SHRESTHA
2021 Batch
PU Regd. No: 152-6 -2- 05370-2021

SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE OF BACHELOR OF PUBLIC HEALTH (BPH)

SUBMITTED TO:

DEPARTMENT OF PUBLIC HEALTH
PURBANCHAL UNIVERSITY SCHOOL OF HEALTH SCIENCES
GOTHGAUN, MORANG
NEPAL

2025

DECLARATION

To the best of my knowledge and belief I declare that this research entitled "***Knowledge on Digital Health and Its Associated Factors among Undergraduate Public Health Students of Nepal***" is the result of my own research and contains no material previously published by any other person except where due acknowledgement has been made. This research report contains no material, which has been accepted for the award of any other degree in any university.

Student's Signature:

Student Name: Dipesh Shrestha

Batch: 2021

PU Registration no.: 152-6 -2- 05370-2021

Date:

SUPERVISOR CERTIFICATE

As being the research supervisor of ***Dipesh Shrestha*** who is a BPH student in the Department of Public Health, Purbanchal University School of Health Sciences, Gothgaun, Morang, Nepal. I would like to certify that I have sighted the documentation supporting the research report entitled "***Knowledge on Digital Health and Its Associated Factors Among Undergraduate Public Health Students of Nepal***" and I am satisfied that the documentation is sufficient as the basis for examination. So, I would like to recommend for final evaluation of this research.

……..

Jamuna Gautam

Assistant Professor

Purbanchal University School of Health Sciences, Gothgaun, Morang

Date:…….

APPROVAL SHEET

ACKNOWLEDGEMENT

I would like to express my sincere gratitude and deep sense of appreciation to my research supervisor, Assistant Prof. Jamuna Gautam, Department of Public Health, Purbanchal University School of Health Sciences. Her valuable guidance, constant encouragement, and constructive suggestions throughout the research period were instrumental in completing this study.

I am highly indebted to Associate Professor Dr. Binita Kumari Paudel, for her continuous support and mentorship in the overall research process. My sincere thanks also go to Ms. Sushila Acharya and Asst. Prof. Sudarshan Dhungana for their invaluable expertise and time contributed towards the validation of the questionnaire, which ensured the quality of this study. I would also like to acknowledge Ms. Garima Sharma, System Engineer of SunyaEk, for providing valuable insignt for the question validation.

I extend my sincere thanks to Assistant Professor Nabin Lamichhane, Head of the Department of Public Health, and Ms. Dipty Subba, Campus Director, for providing the necessary academic environment and administrative support.

I am grateful to all my classmates and senior for their help and camaraderie, with special mention to Mahesh Bhandari, Abhishek Tiwari, Samir Pariyar, Mahesh Nath, Suman Neupane for their support and encouragement during this journey.

Finally, my deepest appreciation goes to all the participants (the undergraduate public health students from various universities) who voluntarily participated in this study and provided the valuable data that made this research possible.

Dipesh Shrestha
Bachelor of Public Health (BPH)
Purbanchal University School of Health Sciences
Gothgaun, Morang

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS

AI - Artificial Intelligence

BPH - Bachelor of Public Health

CAGR - Compound Annual Growth Rate

CDC - Centers for Disease Control and Prevention

DHIS2 - District Health Information Software 2

EHR - Electronic Health Record

EMR - Electronic Medical Record

FFHE: Fisher-Freeman-Halton Exact test

GDHS - Global Digital Health Strategy

ICTs - Information and Communication Technologies

ISO - International Organization for Standardization

ITU - International Telecommunication Union

mHealth - Mobile Health

P3CE - Prevention, Promotion, Protection, Control, and Early Diagnosis

SDGs - Sustainable Development Goals

USD - United States Dollar

UNDP - United Nations Development Programme

WHO - World Health Organization

ABSTRACT

INTRODUCTION: Digital health is a multidisciplinary field integrating technologies such as telehealth, mHealth, wearable devices, and electronic health records (EHRs) to enhance health outcomes and facilitate data-driven interventions. While digital health is increasingly vital for strengthening healthcare systems and achieving Sustainable Development Goals, its integration into public health education in Nepal remains underexplored. Despite government initiatives like the Digital Nepal Framework, there is a concern that current Bachelor of Public Health (BPH) curricula fail to adequately prepare students for the modern digital health landscape.

OBJECTIVE: The primary objective of this study was to assess the level of knowledge regarding digital health among undergraduate public health students in Nepal.

METHODOLOGY: This study employed a quantitative, web-based, cross-sectional design aimed at undergraduate BPH students across various universities in Nepal. A total of 275 students were selected using a purposive sampling technique.

FINDINGS: The study revealed that students possess a moderate overall knowledge level with a mean score of 79.69%. Despite moderate knowledge, 91.3% of participants reported low prior exposure to digital health, with 82.5% having received no formal training and 42.9% reporting that digital health was not included in their curriculum. A statistically significant association was observed between age category and knowledge ($p = 0.0042$), Monthly income ($p = 0.0002$) and academic progression ($p = 0.0236$).

CONCLUSION: The study concludes that while undergraduate public health students in Nepal hold a foundational, informally acquired understanding of digital health, the formal BPH curriculum is not systematically equipping them with necessary professional competencies.

Keywords: Digital health, public health students, knowledge assessment, curriculum gap, Nepal

CHAPTER - 1

1.1 INTRODUCTION

Digital health is a multidisciplinary field that integrates digital technologies to enhance health outcomes. It extends beyond traditional eHealth frameworks by incorporating consumer-driven applications and an extensive array of smart devices and connected health equipment. The key components of digital health include telehealth, mHealth, wearable devices, electronic health records (EHRs), big data analytics, and artificial intelligence (AI). These elements collectively facilitate the systematic integration of information and communication technologies (ICTs), computer science, and data analytics, empowering informed decision-making by individuals, healthcare professionals, and health systems. The ultimate aim is to sustain resilience against disease outbreaks and enhance overall health outcomes and well-being.(1,2). This study include components of digital health; telehealth, mHealth, wearable devices, electronic health records (EHRs).

The WHO defined telehealth as “the delivery of health care services, where patients and providers are separated by distance.”(3,4) WHO Africa defined mhealth as “The use of mobile and wireless technologies to support the achievement of health objectives.”(5) Wearable devices are those devices that can facilitate remote monitoring and diagnostic support, enabling individuals to actively contribute to their health management and enhance their autonomy in daily life.(6) According to ISO standards, “An electronic health record (EHR) is a digital repository of a patient’s medical information that documents their entire healthcare journey in real time.”(7)

In the 21st century, understanding digital health is crucial as it extends beyond basic technological knowledge. It serves as a tool to enable equitable access to diverse healthcare services.(8) Unlike traditional healthcare, which relies on in-person interactions, digital health enables continuous, data-driven interventions that transcend geographical and temporal barriers.(9) The CDC's Global Digital Health Strategy (GDHS) aims to use digital tools to improve health data access, support healthcare workers, and inform public health decisions.(2)The WHO has also initiated Global Strategy on Digital Health (2020–2025) aims to guide countries in building sustainable

digital health foundations.(4) According to ITU, UNDP, and partners, digital technologies play a direct role in achieving 70% of the Sustainable Development Goals (SDGs). The SDG Digital initiative bridges technological advancements with strategies to accelerate progress toward these critical global objectives.(10)

Nepal, being a lower-middle-income country between China and India, healthcare access is challenging. With 83% of the population in rural areas and 25% living below the poverty line, infrastructure and human resources are inadequate. The government struggles to implement universal health coverage due to economic limitations and the difficult terrain, which hampers healthcare delivery. Digital health solutions are becoming essential to improve healthcare accessibility in remote regions.(11,12) The Ministry of Health and Population, Nepal Government has emphasized policies like the e-Health Strategy (2017), Digital Nepal Framework (2019), and Health Sector Strategic Plan (2023–2030) and the key systems include DHIS2, EHR/EMR, OpenIMIS, and platforms for health facility/worker registries, disease management, and telemedicine.(13) Digital health initiatives in Nepal show strong potential to support SDG 3, despite barriers such as infrastructure challenges and limited digital literacy. These efforts can improve health outcomes and aid in meeting SDG 3 targets.(14)

CEA Winslow defined Public Health as "The science and art of preventing disease, prolonging life, and promoting health through the organized efforts and informed choices of society, organizations, public and private communities, and individuals."(15) The Bachelor of Public Health (BPH) program in Nepal offers specialized training with a focus on research and community engagement to tackle public health challenges and enhance outcomes. Key institutions offering this program include Purbanchal University, Tribhuwan University, and Pokhara University.(16) Public health is centered on the principles of health promotion, disease prevention, health protection, epidemic control, and the encouragement of early diagnosis (P3CE).(17) Digital health plays a critical role in advancing these areas by applying technological innovations to improve health results. Yet, Nepal universities' Bachelor of Public Health (BPH) programs fail to incorporate digital health as a core focus,

limiting the potential to enhance population health through modern, evidence-based interventions.(17,18,19)

1.2 RATIONAL OF THE STUDY

Straits Research has reported that the global digital health market is currently valued at USD 239.23 billion for 2023, with projections indicating a substantial increase to USD 1,015.84 billion by 2032, reflecting a compound annual growth rate (CAGR) of 17.34%.(20) This research examines whether public health professionals of Nepal are adequately equipped to participate in this swiftly growing digital health landscape.

The study “Challenges and opportunities for implementing digital health interventions in Nepal: A rapid review” shows Nepal’s healthcare system faces challenges such as rural-urban disparities and limited infrastructure but can improve with digital health intervention.(11) This study help in addressing this gap by evaluating the digital health knowledge of future public health professionals, thereby providing crucial insights that can inform targeted educational interventions to strengthen digital health integration across Nepal’s healthcare system.

Nepal’s government has prioritized digital health through the Digital Nepal Framework 2019 and e-Health Startegy 2017.(13) The success of these initiatives heavily depends on having healthcare workers who are competent in digital health technologies. My assessment of student knowledge is help in identifying the gap.

Despite the World Health Organization's (WHO) emphasis on digital health within its Global Strategy on Digital Health 2020-2025 to achieve the Sustainable Development Goals (SDGs), the Bachelor of Public Health (BPH) curriculum at Purbanchal University lacks comprehensive integration of digital health.(17) This discrepancy between global health priorities and current educational practices underscores the need for an assessment of students' digital health knowledge to guide potential curriculum reforms.

Digital health initiatives in Nepal have the potential to advance SDG 3 by improving healthcare access and outcomes, despite challenges like infrastructure gaps and low digital literacy. With digital technologies influencing 70% of the SDGs, assessing the knowledge of undergraduate public health students is crucial to preparing future

professionals for effective implementation and advocacy of digital health solutions.(10,14)

1.3 OBJECTIVES

1.3.1 General Objective

1. To assess the level of knowledge on digital health among undergraduate public health students of Nepal.

1.3.2 Specific Objectives

1. To determine the level of knowledge on the digital health among undergraduate public health students of Nepal.
2. To determine the level of prior exposure on the digital health among undergraduate public health students of Nepal.
3. To examine the association between the digital health prior exposure and its knowledge among undergraduate public health students of Nepal.
4. To examine the association between Socio-demographic factors and the knowledge of digital health among undergraduate public health students of Nepal.

1.4 RESEARCH QUESTIONS

1.4.1 Research Questions

1. What is the level of knowledge among undergraduate public health students in Nepal regarding digital health?
2. Which digital health domain do public health students in Nepal have the most knowledge about?
3. What is the level of prior exposure among undergraduate public health students in Nepal regarding digital health?
4. Is digital health knowledge associated with prior exposure of digital health?
5. Are socio-demographic factors associated with variations in digital health knowledge?

1.5 STUDY VARIABLE

1.5.1 Independent Variables

1) Socio-Demographic Variables
    i) Age
    ii) Sex
    iii) University
    iv) Socioeconomic Staus (parental education, place of residence, Family Income)
    v) Background of study (+2 science or diploma in health sciences)
    vi) Academic Year
2) Prior Exposure Variables
    a. BPH curriculum
    b. Formal training
    c. Online courses

1.5.2 Dependent Variables

1) Level of knowledge on the digital health domains (telehealth, mHealth, wearable devices, and EHR)

1.6 CONCEPTUAL FRAMEWORK

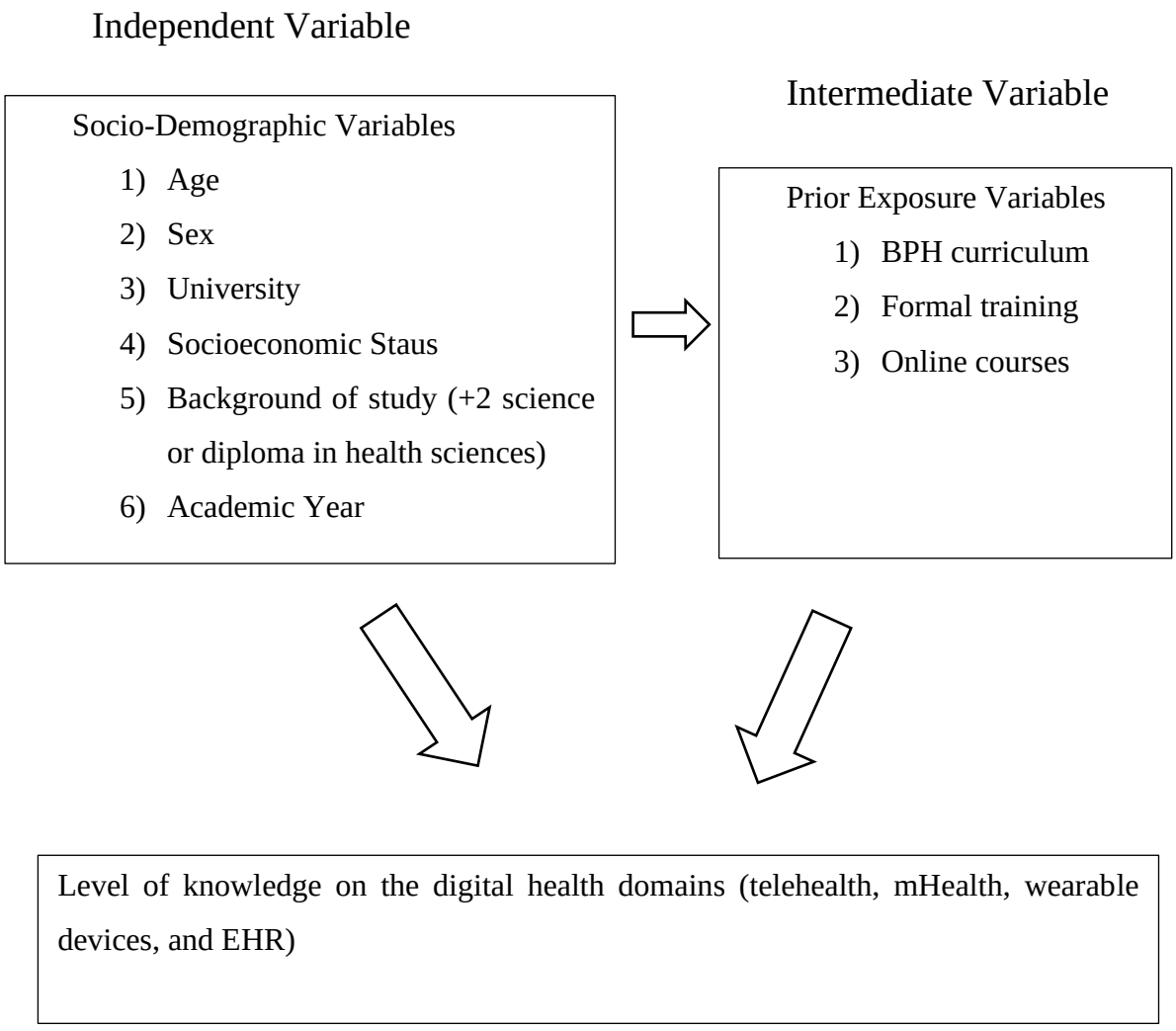

Figure 1 : Conceptual Framework of the Variables

1.7 OPERATIONAL DEFINATIONS

1. Digital Health Components

Digital Health: A multidisciplinary field that leverages digital technologies (telehealth, mHealth, wearable devices, and electronic health records (EHRs)) to improve health outcomes, facilitate continuous, data-driven interventions, and support informed decision-making by individuals, healthcare professionals, and health systems.

Telehealth: The delivery of healthcare services where the patient and provider are physically separated by distance. In this study, telehealth encompasses any telecommunications-based method used to provide health care, consultations, or follow-up services.

mHealth: The use of mobile and wireless technologies (e.g., smartphones, tablets, and mobile applications) to support the achievement of health objectives. This includes any mobile-based service or application aimed at improving health management and access to healthcare.

Wearable Devices: Devices that can be worn on the body (such as smartwatches, fitness trackers, or other connected gadgets) and are used for the remote monitoring of health-related parameters. In this research, they are seen as tools for early diagnostic support and enabling individuals to actively manage their health.

Electronic Health Records (EHRs): A digital repository that maintains a population health information in real time, documenting their entire healthcare journey. In this research, EHRs are considered as the systematic digital documentation of population data, facilitating improved continuity and quality of care.

2. Study Variables

2.1. Dependent Variable (Level of Knowledge on Digital Health)

Measurement: The level of the knowledge was assessed using a structured questionnaire composed of multiple-choice questions.

Scoring: Each correct answer is scored as 1, and each incorrect answer is scored as 0.

Classification:

Table 1: Level of knowledge classification

Knowledge Classification	Score
Low knowledge	<50%
Moderate knowledge	50-80%
High knowledge	>80%

2.2 Independent Variables (Prior Exposure variables)

1. **BPH Curriculum**: The content provided within the Bachelor of Public Health (BPH) program, particularly courses that address digital health topics.

   There was a structured questionnaire and scoring for inclusion of digital health in BPH curriculum such that:

   0 = No Inclusion of digital health

   1 = Partial inclusion of digital health

   2 = Full inclusion of digital health

2. **Formal Training**: Structured training sessions or educational programs specifically designed to impart digital health knowledge.

   There was structured questionnaire and a scoring for participation in training of digital health such that:

   0 = No Participation

   1 = Yes; not certified

   2 = Yes; with certification

3. **Online Courses**: Virtual courses that focus on digital health principles and applications.

   There was structured questionnaire and a scoring for taking online course of digital health such that:

   0 = No

   1 = Yes; only one

   2 = Yes; more than one

Measurement: The level of the prior exposure was assessed using a structured questionnaire composed of multiple-choice questions.

Scoring:

Each independent variable was scored on a **0–2 scale**, giving a **total possible score of 6** across:

1. BPH Curriculum Inclusion (0–2)
2. Formal Training (0–2)
3. Online Courses (0–2)

- **Low Exposure (0–2)**: Minimal or no exposure to digital health through curriculum, training, or courses.
- **Moderate Exposure (3–4)**: Some exposure, such as partial inclusion or participation without certification.
- **High Exposure (5–6)**: Extensive exposure, such as full curriculum inclusion and certified training or multiple online courses.

Classification:

Table 2: Level of prior exposure classification

Prior exposure Classification	Score
Low prior exposure	0-2
Moderate prior exposure	3-4
High prior exposure	5-6

2.3 Socio-Demographic Variables:

1. **Age**: The total number of years completed by each participant at the time of data collection.
2. **Sex**: The self-reported gender identity of the participant.
3. **Socioeconomic Status**: A composite measure of the participant's monthly household economic status, including parental education level and place of

residence (Rural Municipality or Municipality or Sub-Metropolitan city or Metropolitan city).

4. **Educational Background**: The participant's prior academic indicating whether they have completed a +2-science program or a diploma in health sciences.

CHAPTER -2: LITERATURE REVIEW

2.1 Thematic Literature Review

Digital health literacy, also known as electronic health literacy (e-Health literacy), refers to an individual's capacity to search, understand, and evaluate health information available on digital media. In the 21st century, comprehending digital literacy is crucial as it is more than just a basic understanding of technology; it is a fundamental tool enabling equal access to various service categories, including health services.(8) The global digital health market is experiencing substantial growth, valued at USD 239.23 billion in 2023 and projected to increase to USD 1,015.84 billion by 20325.(20) Digital health initiatives in Nepal hold the potential to advance Sustainable Development Goal 3 (SDG 3) by improving healthcare access and outcomes.(14) Despite the recognised potential, Nepal's healthcare system faces challenges in implementing digital health interventions, including inadequate technical facilities (such as lack of electricity and internet), rugged geographical distribution, a shortage of skilled workforce, and insufficient supportive policies. However, opportunities exist, such as the potential for educating and training students and health practitioners and increasing awareness among the general population(11)

2.2 Empirical Literature Review

The Study among health workers and students in Nepal and other regions have assessed digital health knowledge and literacy levels. A study among health workers in selected municipalities of Lalitpur district, Nepal, found that 70.59% had high digital health literacy, and 67.65% had a good attitude towards digital health technology.(8) In another study, among undergraduate nursing students in Kathmandu, Nepal, the self-perceived level of eHealth literacy was moderate, with a median score of 3.69 on a 5-point scale. They were found to have some basic necessary skills, but other skills still require improvement. (21) This rapid review synthesized findings from over 30 primary studies conducted between 2010 and 2021, focusing on digital health adoption, including EHR, telemedicine, and mHealth across Nepal. Although not centered solely on undergraduate students, the review included studies assessing the digital readiness and training needs of healthcare trainees and early-career professionals. The findings revealed common challenges such as insufficient infrastructure, weak policy frameworks, and low digital health literacy. However, the review also identified

opportunities for strengthening digital health capacity through formal education and practical training, indicating a clear need for integrating digital health, including EHR use, into undergraduate public health and medical curricula in Nepal.(11)

In China, a study involving undergraduate nursing students found their digital health literacy was at a moderate level, with a mean score of 74.78 ± 8.44 out of a possible 100. (22) Research in Egypt among medical university students revealed that despite high technology adoption, students lacked the necessary knowledge and skills for properly searching, choosing, and evaluating online health information. While seeking health information for personal purposes was common (87.1%), students showed deficiency in checking the reliability of messages and the quality of the provider.(23) Austrian medical students surveyed demonstrated a mean score of 11.74 out of a possible 32 in a knowledge self-assessment section, suggesting they knew on average only about one-third of the digital terms.(24)

The study among medical students evaluated the knowledge and attitudes toward telemedicine among medical students in 19 medical colleges in Nepal. It found that while students had good knowledge of telemedicine's importance, few had received formal training. Most were dissatisfied with current telemedicine practices but optimistic about its future use, highlighting the need for structured education in the curriculum. (25) This cross-sectional study assessed 307 undergraduate medical students' knowledge, perception, and practice of telemedicine. While 75.8% were aware of telemedicine, only 18.8% recognized its use for prescribing drugs, and 59.9% had a low perception of telemedicine. The majority preferred traditional hospital visits, citing concerns about information, expertise, and technical challenges. The study emphasized the need for telemedicine training and integration into medical education.(26)

A cross-sectional study conducted at University Malaysia Sarawak examined the awareness, attitudes, and usage patterns of mobile health (mHealth) applications among undergraduate medical students. The study found that students generally had high awareness and positive attitudes toward mHealth apps, with an average attitude score close to 4 out of 5. However, the actual usage of mHealth apps, especially those designed for educational purposes, was relatively low. Barriers such as difficulty in selecting appropriate apps, concerns regarding cost, and data security were identified

as key limitations to greater adoption.(27) In Pakistan, a multi-institutional cross-sectional survey was conducted among clinical-year undergraduate medical students across four medical colleges to evaluate their awareness, perceived usefulness, and usage of smartphone applications for clinical education. The study revealed that approximately 72% of the students actively used medical-related apps, and those who did reported enhanced clinical performance, quicker access to medical guidelines, and improved diagnostic skills. Despite these benefits, the lack of institutional recommendations and formal integration into the curriculum was noted as a significant barrier to wider adoption.(28)

This cross-sectional study conducted at B.P. Koirala Institute of Health Sciences (BPKIHS) assessed the electronic health literacy of 125 medical and dental interns using the eHealth Literacy Scale (eHEALS). The survey aimed to evaluate the interns' self-perceived ability to locate, assess, and apply online health information, which are crucial competencies for effectively engaging with EHR systems. The findings revealed that approximately 25% of participants were uncertain about the usefulness of online resources for health-related decision-making, and many struggled to differentiate between reliable and unreliable online health information. These results indicate a significant gap in eHealth literacy among recent medical graduates, suggesting that additional training may be necessary to ensure effective use of electronic health systems in clinical settings.(29)

A cross-sectional survey among 500 undergraduate medical students to assess their awareness, attitudes, and practices regarding wearable health devices. The findings revealed that 68% of the participants were aware of such devices, and 42% had experience using them—mainly for tracking fitness-related metrics like step count and heart rate. The study also found a significant association between knowledge levels and factors such as urban residency and access to internet-based resources.(30) A cross-sectional study examined the use of wearable health devices among 1,000 university students. The results showed that only 20% of students were regular users of wearables. Those who used them reported improved awareness of their physical activity levels. Nonetheless, the study identified key barriers to continued use, including concerns about the accuracy of the data and privacy issues.(31)

2.3 Summary of Literature Review

The reviewed literature highlights the increasing importance of digital health and the need for competent healthcare professionals in this evolving landscape. While studies have explored digital health literacy and knowledge among health workers, medical students, and nursing students in Nepal and other regions, there is a notable gap regarding undergraduate public health students in Nepal. Existing research in Nepal indicates varied levels of digital health literacy among health workers and moderate self-perceived eHealth literacy among nursing students, alongside some awareness of telemedicine among medical students. Challenges in Nepal's digital health implementation, such as infrastructure limitations and workforce shortages, underscore the importance of assessing the preparedness of future public health professionals.

The literature suggests that factors like education level, income, and prior exposure, including formal training and academic performance, are associated with digital health literacy and competence. However, findings on the influence of socio-demographic factors like gender and academic year are not entirely consistent across different studies.

This review underscores the relevance of investigating digital health knowledge among undergraduate public health students in Nepal. The proposed study is necessary to specifically determine their level of knowledge, assess how prior exposure (curriculum, training, online courses) impacts their competence, and examine the association of socio-demographic factors with their digital health knowledge within the specific context of public health education in Nepal. This understanding can inform targeted educational interventions and curriculum reforms to better prepare future public health professionals for the digital health era in Nepal.

CHAPTER – 3: METHODOLOGY

3.1 Study Design

This study employed a quantitative web-based descriptive cross-sectional design to assess the level of knowledge about digital health among undergraduate public health students in Nepal. This design was appropriate as it allowed for the systematic collection of data at a single point in time, enabling the measurement of knowledge levels and their associations with socio-demographic and prior exposure variables. The cross-sectional approach aligned with the study's objectives of identifying gaps and informing curriculum reforms.

3.2 Study Area/Setting

The study was conducted to the student currently studying in bachelor of public health through web-based platform. The web-based platform ensured accessibility for students in geographically diverse regions, including rural areas, and accommodates logistical constraints.

3.3 Study Population

The study population for this research consisted of all undergraduate students enrolled in Bachelor of Public Health (BPH) programs throughout Nepal. A finite population of 2,000 was conservatively estimated for the study, based on the seat allocation of approximately 670 by the Medical Education Commission on 2025 for the four-year program. This estimation was necessary as a precise student census is not publicly available. This finite population size was then utilized to calculate a representative sample size for the study.

3.4 Selection Criteria: Inclusion and Exclusion Criteria

Inclusion Criteria

Participants who met the following criteria included in the study:

1. Undergraduate students currently enrolled in the Bachelor of Public Health (BPH) program from any university in Nepal.
2. Students from any academic year (1st to final year).
3. Students with personal email/ social media, as the study was conducted online.

4. Students who provide informed consent to participate in the research.

Exclusion Criteria

Participants was excluded from the study who:

1. Declined to provide informed consent.

3.5 Sample Size

The appropriate sample size for a study involving an effectively finite population, the following simplified formula was used:

$n = (Z^2pqN) / (d^2(N-1) + Z^2pq)$

Where:

- n represents the calculated sample size.
- Z is the Z-score corresponding to the pre-determined confidence level.
- p signifies the estimated prevalence or proportion of the characteristic of interest within the population.
- d indicates the acceptable margin of error.
- N indicate the Population Size

The specified parameter for this calculation:

- Prevalence (p) = 70.59%
- Confidence Level = 95, corresponding to a Z-score (Z) of 1.96.
- Margin of Error (d) = 5 or 0.05.
- Population Size (N) = 2000

Substituting these values into the formula:

$n = (1.96^2 \times 0.7059 \times 0.2941 \times 2000) / (0.05^2 \times (2000-1) + 1.96^2 \times 0.7059 \times 0.2941)$

$n = 275$

The requisite sample size was determined to be 275.

3.6 Sampling Technique

The sampling technique used was Purposive Sampling Technique.

3.7 Data Collection Technique

Data was collected through an online structured questionnaire administered via Google Forms. The questionnaire was self-administered and was distributed through various channels, including email, and social media such as WhatsApp and Facebook. To enhance response rates, reminders was sent out on a weekly basis over a period of three weeks.

3.8 Data Collection Tools

A structured questionnaire was prepared and distributed to the respondent that included:

1. Socio-demographic Section: Age, sex, socioeconomic status (parental education, residence), and educational background.
2. Prior Exposure Section: Inclusion of digital health in the BPH curriculum, formal training, and online courses.
3. Knowledge Assessment Section: 20 multiple-choice questions (5 per domain: telehealth, mHealth, wearables, EHRs)

3.9 Pretesting of The Tools

The questionnaire was pretested with 30 BPH students to assess clarity, reliability, and validity. Ambiguous questions were revised based on feedback.

3.10 Data Collection and Procedure

1. Ethical approval was obtained from Purbanchal University's IRC.
2. College Representative were contacted to share the survey link with eligible students.
3. Participants were asked to provide electronic informed consent before proceeding.
4. Data collection was occurred over weeks, with weekly reminders.

3.11 Data Processing and Analysis

1. Data Entry: Raw data was exported from Google Forms into Excel for getting .csv file.
2. Data Cleaning: Removal incomplete or duplicate responses, Variable Coding
3. Analysis:

   Descriptive Statistics:

   - Frequencies and percentages of Socio-demographic variables
   - Overall and domain-specific knowledge levels was summarized using proportions and domain dominance was identified by comparing mean scores across the four components.

   Inferential Statistics

   - One-sample t-tests was used to compare mean knowledge scores against a hypothesized benchmark (50%).
   - Chi-square tests was used to evaluate associations between categorical variables and knowledge levels.
4. Software: Python libraries for data manipulation and visualization

3.12 Quality Control and Quality Assurance

1. Pretesting was conducted on 10% of the sample to refine survey questions based on feedback.
2. Duplicate response prevention was implemented through Google Forms settings that restrict multiple entries from the same participant.
3. Response validation was ensured through mandatory fields and real-time error checks to maintain completeness and accuracy.
4. Data cleaning was performed by reviewing exported responses in Excel to remove inconsistencies.
5. Python-based analysis was conducted using NumPy, Pandas and SciPy for data processing.
6. Standardized data entry was maintained to ensure structured and uniform data for accurate analysis.

7. Random manual review was performed on a subset of responses to check for reliability.

3.13 Validity and Reliability of Research

Validity:

The questionnaire was designed to ensure content validity by covering key aspects of digital health knowledge, including telehealth, mHealth, wearable devices, and EHRs. It was reviewed and validated by the supervisor that align with research objectives.

Reliability:

A pretest with a small sample was done to identify inconsistencies and refine question clarity before full-scale data collection.

3.14 Ethical Consideration

- Ethical approval was obtained from Purbanchal University's IRC before conducting the study.
- Participants were asked to provide informed consent via a digital form in the online questionnaire, which included details on the study's purpose, voluntary participation, withdrawal rights, data handling, and confidentiality assurances; participants must had to click "I Agree" to proceed.
- Data was securely stored on a password-protected laptop, anonymized by removing identifiers and assigning unique codes, and raw data weren't shared with third parties.
- Results were shared with Purbanchal University and stakeholders to inform educational policy reforms while ensuring participant anonymity.

CHAPTER-4: RESULT/FINDINGS

This chapter presents a comprehensive analysis of the data collected for the study. The first 275 questionnaires were selected for the final data analysis, resulting in a total of 275 participants. The findings are organized into five main sections to ensure a systematic and clear presentation.

Section I: Socio-demographic characteristics

Section II: Knowledge to digital health

Section III: Prior exposure to digital health

Section IV: Factors associated with digital health knowledge

Section I: Socio-Demographic Characteristics

This section shows the socio-demographic profile of the undergraduate public health students who participated in the study. The socio-demographic characteristics of the 275 participants, including gender, age, academic year, university affiliation, and family's monthly income, are summarized in below Table.

Table 3 shows that the study population was predominantly female, comprising 58.9% of the respondents, while 41.1% were male. The mean age of the participants was 23.29 years. A substantial majority of the students 70.5% fell within the 20-24-year age group, establishing it as the largest cohort.

Regarding the academic profile of the respondents, third-year students constituted the largest group, representing 42.2% of the sample. The majority of participants 66.5% were affiliated with Purbanchal University. Furthermore, a significant proportion 76.0% of students entered their public health program from a +2-science background, while the remaining 24.0% held a diploma in health sciences.

Analysis of the socio-economic background reveals that most students 54.9% reside permanently in a municipality. In terms of parental education, the distribution was relatively balanced: 35.3% of students reported that both parents had completed secondary education or higher, 33.1% had one parent with secondary education, and 31.6% had neither parent completing secondary education. The family monthly income data indicates that a substantial majority 69.8% reported an income of NPR 30,000 or more.

Table 3: Socio-Demographic Characteristics of Participants (n=275)

Characteristics	Frequency (f)	Percentage (%)
Gender		
Female	162	58.9
Male	113	41.1
Age Group (Years)		
15-19	16	5.8
20-24	194	70.5
25-29	49	17.8
30-34	16	5.8
Parental Education		
Both parents secondary or higher	97	35.3
One parent secondary	91	33.1
Neither parent secondary	87	31.6
Place of Residence		
Rural Municipality	65	23.6
Municipality	151	54.9
Sub-Metropolitan City	30	10.9
Metropolitan City	29	10.5
Academic Year		
First Year	39	14.2
Second Year	38	13.8
Third Year	116	42.2
Final Year	82	29.8
University		
Purbanchal University	183	66.5
Madan Bhandari Academy	35	12.7
Tribhuvan University	24	8.7
Karnali Academy	23	8.4
Pokhara University	10	3.6
Family Monthly Income (NPR)		
< 10,000	12	4.4
10,000 - 19,999	23	8.4
20,000 - 29,999	48	17.5
≥ 30,000	192	69.8
Education Background		
+2 Science	209	76.0
Diploma in Health Sciences	66	24.0

Section II: Knowledge to Digital Health

Table 4 shows that large majority of respondents correctly defined digital health as the application of information and communication technologies across the health system (86.6%). Similarly, over 90% accurately identified core components of the digital

health ecosystem, including telehealth, mHealth, wearable devices, and electronic health records, reflecting strong foundational knowledge.

Most participants recognized the role of digital health in public health improvement (91.6%) and epidemic surveillance (92.4%), particularly through real-time data collection and reporting. However, misconceptions were minimal, with very few respondents associating digital health with replacing vaccines, laboratory tests, or public health institutions.

In the context of Nepal, limited digital literacy was identified as the primary barrier to digital health adoption in rural areas (88.4%), highlighting a critical implementation challenge. Telehealth was largely understood as a broad field encompassing both clinical and non-clinical services (55.3%), and real-world telehealth scenarios—such as rural health workers consulting specialists via video calls—were widely recognized (50.9%). Improving access for remote and underserved populations was identified as the key advantage of telehealth (65.5%), while frequent power outages were reported as the main sustainability challenge (63.3%). Patient data privacy and confidentiality emerged as the most critical ethical concern (90.2%).

Regarding mHealth, most respondents correctly identified mobile devices and wireless technologies as its core (77.1%) and emphasized its role in providing timely reminders and strengthening health systems. Real-time disease reporting by community health workers was widely acknowledged as the primary surveillance application (89.5%). Language and cultural appropriateness were highlighted as significant challenges for mHealth implementation in Nepal (55.3%).

Knowledge related to wearable devices was also strong, with over 90% recognizing their role in monitoring physical activity, heart rate, sleep patterns, and supporting non-communicable disease management. Nonetheless, lack of awareness, affordability, and perceived usefulness were reported as major barriers to adoption (83.6%).

Finally, most respondents demonstrated good understanding of electronic health records, correctly defining EHRs as secure, comprehensive digital patient records (82.9%) and recognizing their role in improving continuity of care (74.2%). The DHIS2 system was correctly identified by nearly 90% as Nepal’s national health information

management system. Interoperability was well understood, though limited digital infrastructure in rural areas was highlighted as the major challenge for EHR implementation (69.5%).

Table 4 : Descriptive Analysis across Digital Health Domains

Characteristics	Frequency (f)	Percentage (%)
Definition of Digital Health		
The application of information and communication technologies (ICT) across the entire spectrum of health and healthcare delivery	238	86.55
The professional use of social media by doctors to share health tips	21	7.64
The process of completely replacing all traditional healthcare services with automated technology	10	3.64
The specific practice of digitizing paper-based patient records into PDF files	6	2.18
Key Components of Digital Health Ecosystem		
Telehealth, mHealth, wearable devices, and Electronic Health Records (EHRs)	255	92.73
Only social media and health-focused television shows	13	4.73
Only hospital administration software and billing systems	6	2.18
Traditional medicine practices and printed health journals	1	0.36
Digital Health Support for Public Health		
By applying technological innovations to improve health results for the whole population	252	91.64
By replacing the need for public health organizations and community efforts	12	4.36
By focusing only on treating individual patients after they get sick	7	2.55
By limiting healthcare access to only those with advanced technical skills	4	1.45
Digital Health for Epidemic Control/Surveillance		
Through real-time data collection, analysis, and reporting	254	92.36
Through solely manual record-keeping	13	4.73
By eliminating the need for vaccines	4	1.45
By replacing all laboratory tests	4	1.45
Barriers to Digital Health Adoption (Rural Nepal)		
Limited digital literacy among users and providers	243	88.36
Strong internet infrastructure	22	8.00
High smartphone ownership	8	2.91
Overabundance of healthcare workers	2	0.73
Definition of Telehealth		
A broad field that uses telecommunications to deliver health care, health education, and health information services, both clinically and non-clinically	152	55.27
The practice of medicine using telecommunication technology to provide clinical care from a distance, primarily involving real-time video calls between a doctor and patient	109	39.64

Characteristics	Frequency (f)	Percentage (%)
The use of electronic health records (EHRs) and other patient data between different healthcare institutions	9	3.27
The use of mobile devices for the purpose of personal health and wellness tracking by an individual	5	1.82
Scenario Examples of Telehealth		
A health worker in a rural health post consulting a specialist in a city hospital via video call	140	50.91
A public health officer sending an automated SMS reminder to a community about an upcoming vaccination camp	75	27.27
A doctor accessing a patient's digital health record from a different hospital before an in-person appointment	56	20.36
A medical student watching a pre-recorded surgical procedure online as part of their training	4	1.45
Advantage of Telehealth in Challenging Nepal Areas		
Enhancing healthcare access and reducing health disparities for remote and underserved populations	180	65.45
Increasing the personal convenience for individual patients by eliminating their need to travel for every appointment	58	21.09
Facilitating the transition from paper-based medical records to more efficient Electronic Health Record (EHR) systems	30	10.91
Guaranteeing superior health outcomes for all chronic conditions compared to traditional in-person care	7	2.55
Challenge of Sustaining Telehealth in Remote Nepal		
Frequent power outages and unreliable electricity supply	174	63.27
Consistently high-speed internet connectivity	62	22.55
An oversupply of highly qualified telehealth specialists	20	7.27
Ease of patient transportation	19	6.91
Critical Ethical Concerns in Telehealth		
Patient data privacy and confidentiality	248	90.18
Video call quality	10	3.64
Increasing healthcare jobs	9	3.27
Use of traditional medicine	8	2.91
Definition of mHealth		
Mobile devices (like smartphones, tablets) and wireless technologies	212	77.09
Health-related programs broadcasted on national television and radio	32	11.64
Health education materials like posters and brochures	16	5.82
Hospital-based desktop computer networks and landline phones	15	5.45
mHealth for Improved Health Outcomes		
Providing timely reminders for appointments and health tips	214	77.82
Reducing the cost of health care services	40	14.55
By replacing all necessary in-person clinical checkups	20	7.27
Eliminating the need for trained midwives or health workers	1	0.36
Strategic Focus of mHealth		

Characteristics	Frequency (f)	Percentage (%)
Using mobile technologies to strengthen health systems and achieve public health goals	248	90.18
Developing expensive, luxury health apps for a small segment of the population	14	5.09
Banning the use of personal mobile devices inside all clinic premises	13	4.73
Primary Application of mHealth in Surveillance		
Enabling community health workers to report infectious disease symptoms in real-time using a simple mobile form	246	89.45
Replacing laboratory tests for confirming diseases like malaria or dengue	16	5.82
Performing remote surgeries using a smartphone camera	9	3.27
Dispatching ambulances based on GPS location only	4	1.45
Significant Challenges of mHealth in Nepal		
The need for content to be available in multiple local languages and be culturally appropriate	152	55.27
The fact that most Nepalis do not own a mobile phone	87	31.64
Ensuring the app functions on both Android and iOS platforms	30	10.91
The high cost of sending a single SMS message	6	2.18
Monitoring Capabilities of Wearable Devices		
Daily physical activity (step count), heart rate, and sleep patterns	251	91.27
The exact nutritional content of meals consumed	15	5.45
ABO blood group type	6	2.18
The presence of specific bacteria or viruses in the body	3	1.09
Common Limitation of Consumer Wearable Data		
Dependence on correct usage and compliance by the individual	222	80.73
The inability to collect data in real-time	33	12.00
Consistently high accuracy	12	4.36
They require a doctor's prescription to purchase and use	8	2.91
Best Wearable for Non-Communicable Disease Management		
A smartwatch that checks your heart and the oxygen in your blood	251	91.27
Smart Rings that track sleep	14	5.09
Virtual Reality Headsets	6	2.18
Augmented Reality Glasses	4	1.45
Wearable Devices in Preventive Healthcare		
Encouraging self-monitoring of physical activity and vital signs	231	84.00
Replacing the need for all routine hospital or clinic visits	23	8.36
By providing definitive diagnoses for complex diseases	18	6.55
Offering guaranteed cures for chronic health conditions	3	1.09
Hindrance to Wearable Adoption in Nepal		
Lack of awareness, affordability, and perceived utility	230	83.64
Universal access to advanced diagnostic facilities	23	8.36
Income across the population	14	5.09
Government subsidies for purchasing devices	8	2.91
Definition of Electronic Health Record (EHR)		

Characteristics	Frequency (f)	Percentage (%)
A secure, real-time, digital repository of a patient's comprehensive health journey	228	82.91
A public website where anyone can look up a person's medical history	29	10.55
A paper-based folder containing a patient's historical charts	12	4.36
Standardized insurance claim submission forms	6	2.18
Key Advantage of Using EHRs		
It improves the coordination and continuity of care, as authorized providers can access a patient's history	204	74.18
It makes patient health information available only to the patient themselves	37	13.45
It increases the amount of paper that hospitals need to store securely	27	9.82
It requires patient data to be manually re-entered every time they visit a new clinic	7	2.55
DHIS2 System in Nepal (Example of)		
A national-level health information management system for collecting and analyzing aggregated health data	246	89.45
A direct-to-patient video consultation app	14	5.09
A wearable fitness device distributed by the government	13	4.73
An advanced robotic tool used for performing surgeries	2	0.73
Definition of Interoperability (EHRs)		
The ability of different EHR systems from different hospitals or clinics to securely exchange and use health information	217	78.91
The policy of keeping a patient's data isolated within a single hospital's system to ensure privacy	24	8.73
A feature that restricts EHR access to only one specific software company	23	8.36
The requirement for all healthcare staff to have exceptional computer programming skills	11	4.00
Challenges for EHR Implementation in Resource-Limited Nepal		
Limited or unreliable digital infrastructure in rural areas	191	69.45
An overabundance of funding specifically allocated for EHR projects	45	16.36
Exceptionally high digital literacy rates among all healthcare staff	31	11.27
Significant overstaffing in primary healthcare facilities	8	2.91

Through, statistical analysis of the data collected the overall knowledge of the participants to the digital health was found to be 79.69% that demonstrate Moderate level of Knowledge regarding digital health.

Table 5 shows that majority of the students (55.64%) demonstrated a high level of knowledge regarding digital health. Furthermore, 35.64% of students were found to

have a moderate level of knowledge, while a smaller portion, 8.73%, exhibited a low level of knowledge.

Table 5: Overall Knowledge to Digital Health (n=275)

Category	Frequency(f)	Percentage (%)
High knowledge	153	55.63
Moderate knowledge	98	35.63
Low knowledge	24	8.72

The Table 6 indicates a positive correlation across all measured domains of digital health knowledge, suggesting that as a student's understanding in one area grows, it is likely to increase in others as well. Notably, the strongest relationships were observed between knowledge of Electronic Health Records (EHR) and Wearable Devices ($r = 0.657$), and between EHR and mHealth ($r = 0.589$). This suggests a strong interconnectedness in the conceptual understanding of these specific domains. Conversely, the weakest link, though still positive, was found between Telehealth and Wearable Device knowledge ($r = 0.370$).

Table 6: Pearson Correlation Matrix of Knowledge Scores

	Digital Health Knowledge	Telehealth Knowledge	mHealth Knowledge	Wearable Device Knowledge	EHR Knowledge
Digital Health Knowledge	1.000	0.426	0.512	0.479	0.523
Telehealth Knowledge	0.426	1.000	0.416	0.370	0.394
mHealth Knowledge	0.512	0.416	1.000	0.529	0.589
Wearable Device Knowledge	0.479	0.370	0.529	1.000	0.657
EHR Knowledge	0.523	0.394	0.589	0.657	1.000

Section III: Prior Exposure to Digital Health

The study assessed the participants' prior exposure to digital health through their academic curriculum, formal training, and online learning. The analysis indicates that the overall exposure to digital health among the students was low exposure.

The Table 7 shows an overwhelming majority of the participants (91.3%) were classified as having a low level of prior exposure to digital health concepts. A small fraction of students reported moderate exposure (5.8%), while even fewer demonstrated high exposure (2.9%).

Table 7 :Overall Prior Exposure to Digital Health (n=275)

Category	Frequency (f)	Percentage (%)
Low Exposure	251	91.3
Moderate Exposure	16	5.8
High Exposure	8	2.9

The Table 8 shows that the significant gaps in formal digital health education. Regarding the curriculum, while nearly half of the students (49.5%) reported that digital health was partially mentioned in their courses, a substantial portion (42.9%) stated it was not included at all. Only a minor group (7.6%) had a fully dedicated course or module on the subject.

The lack of exposure is even more pronounced in formal training opportunities. A vast majority of respondents (82.5%) had received no formal training in digital health. Similarly, engagement in self-learning through online courses was minimal, with 91.6% of students having completed no courses on the topic. These findings collectively underscore the limited formal and informal educational opportunities in digital health available to the surveyed student population.

Table 8 : Sources of Exposure to Digital Health (n=275)

Characteristics	Frequency (f)	Percentage (%)
Inclusion in Curriculum		
Partially included	136	49.5
Not Included	118	42.9
Fully included	21	7.6
Formal Training		
No formal training	227	82.5
Participated (not certified)	40	14.5
Certified training	8	2.9
Online Courses		
No courses completed	252	91.6
Completed 1 course	13	4.7
Completed ≥2 courses	10	3.6

Section IV: Factors Associated with Digital Health Knowledge

The Table 9 shows that several key factors significantly associated with the participants' knowledge levels. A statistically significant association was observed between age category and knowledge ($p = 0.0042$), with the 20–24 and 25–29 age groups demonstrating the highest proportions of high-level knowledge (59.3% and 59.2%, respectively). Monthly income also emerged as a highly significant determinant ($p = 0.0002$); participants in the highest income bracket (>30,000) showed superior knowledge levels (58.9% high level) compared to those in the lowest income bracket, where 41.7% possessed low-level knowledge. Furthermore, academic progression was significantly linked to knowledge acquisition ($p = 0.0236$), with the proportion of high-level knowledge increasing from 35.9% in the first year to 62.2% by the final year.

Conversely, several variables did not show a statistically significant relationship with knowledge levels ($p > 0.05$). These included gender ($p = 0.074$), university affiliation ($p = 0.1878$), parental education ($p = 0.473$), and permanent residence ($p = 0.6422$). While females (60.5%) appeared to have higher knowledge levels than males (48.7%), this difference was not statistically significant. Similarly, prior exposure to the subject matter did not significantly influence the knowledge outcomes ($p = 0.1606$), suggesting that academic year and economic status are stronger predictors of knowledge within this study population.

Table 9: Association between Independent variable and Knowledge level

Variable	Level of Knowledge			Total (f)	Test Used	χ2 (df)	p-value
	High Level f (%)	Moderate Level f (%)	Low Level f (%)				
Age Category							
15–19	2 (12.5)	11 (68.8)	3 (18.8)	16	FFHE	20.59	**0.0042**
20–24	115 (59.3)	67 (34.5)	12 (6.2)	194			
25–29	29 (59.2)	12 (24.5)	8 (16.3)	49			
30–34	7 (43.8)	8 (50.0)	1 (6.3)	16			
Gender							
Female	98 (60.5)	54 (33.3)	10 (6.2)	162	**χ2**	5.21 (2)	0.074
Male	55 (48.7)	44 (38.9)	14 (12.4)	113			
University							
KAHS	10 (43.5)	10 (43.5)	3 (13.0)	23	FFHE	11.07	0.1878
MBAHS	25 (71.4)	10 (28.6)	0 (0.0)	35			
PoU	4 (40.0)	6 (60.0)	0 (0.0)	10			
PU	103 (56.3)	62 (33.9)	18 (9.8)	183			
TU	11 (45.8)	10 (41.7)	3 (12.5)	24			
Parental Education							
Both Secondary	56 (57.7)	30 (30.9)	11 (11.3)	97	**χ2**	3.53 (4)	0.473
Neither Secondary	51 (58.6)	31 (35.6)	5 (5.7)	87			
One Secondary	46 (50.5)	37 (40.7)	8 (8.8)	91			
Permanent Residence							
Metropolitan	14 (48.3)	14 (48.3)	1 (3.4)	29	FFHE	4.40	0.6422
Municipality	84 (55.6)	53 (35.1)	14 (9.3)	151			
Rural Municipality	40 (61.5)	20 (30.8)	5 (7.7)	65			
Sub-Metropolitan	15 (50.0)	11 (36.7)	4 (13.3)	30			
Monthly Income							
< 9,999	4 (33.3)	3 (25.0)	5 (41.7)	12	FFHE	28.01	**0.0002**
10,000 - 19,999	14 (60.9)	9 (39.1)	0 (0.0)	23			
20,000 - 29,999	22 (45.8)	17 (35.4)	9 (18.8)	48			
30,000+	113 (58.9)	69 (35.9)	10 (5.2)	192			
Education Background							
+2 Science	111 (53.1)	77 (36.8)	21 (10.0)	209	**χ2**	3.09 (2)	0.2133
Diploma (Health)	42 (63.6)	21 (31.8)	3 (4.5)	66			
Academic Year							
1st Year	14 (35.9)	20 (51.3)	5 (12.8)	39	FFHE	14.29	**0.0236**
2nd Year	21 (55.3)	15 (39.5)	2 (5.3)	38			
3rd Year	67 (57.8)	43 (37.1)	6 (5.2)	116			
Final Year	51 (62.2)	20 (24.4)	11 (13.4)	82			
Prior Exposure							
High	3 (37.5)	3 (37.5)	2 (25.0)	8	FFHE	6.54	0.1606
Moderate	6 (37.5)	7 (43.8)	3 (18.8)	16			
Low	144 (57.4)	88 (35.1)	19 (7.6)	251			

χ2: Chi-square test of independence *FFHE: Fisher-Freeman-Halton Exact test*

CHAPTER-5: DISCUSSION

This study aimed to assess the level of knowledge on digital health and its associated factors among undergraduate public health students in Nepal. The findings reveal a significant paradox: while students demonstrated a moderate level of overall knowledge in digital health, their formal exposure to the subject through academic curricula and training remains overwhelmingly low. This suggests that the existing knowledge base is largely acquired through informal channels rather than structured educational pathways. This chapter interprets these findings, contextualizes them within the existing literature and acknowledges the study's limitations.

5.1 Summary and Interpretation of Key Findings

The primary finding of this study is that undergraduate public health students in Nepal possess a moderate level of knowledge regarding digital health, with a mean score of 79.69%. Notably, students exhibited high proficiency in domains such as the general concept of Digital Health (90.33%) and Wearable Devices (86.18%), while their understanding of Telehealth was comparatively lower (65.02%). This discrepancy suggests that students are more familiar with consumer-facing technologies and broad concepts, likely due to personal interest and media exposure, than with the practical and systemic applications of digital health in service delivery.

Despite this moderate knowledge, an overwhelming 91.3% of students reported low prior exposure to digital health through formal education. This disconnect is a critical finding, indicating that the current Bachelor of Public Health (BPH) curricula in Nepal are not adequately preparing students for a rapidly evolving digital health landscape. The knowledge that students do possess appears to be self-acquired, a conclusion supported by the lack of a statistically significant association between their knowledge levels and formal exposure.

The study also identified several socio-demographic factors significantly associated with higher digital health knowledge. These include older age, higher family monthly income, being male, and having a background in +2 Science rather than a diploma in health sciences. The association with age and income suggests that greater life experience and access to resources, such as personal technology and reliable internet, may facilitate informal learning. The gender disparity, with male students

demonstrating higher knowledge, may reflect broader societal trends in technology access and engagement in Nepal.

5.2 Comparison with Existing Literature

The findings of this study, which indicate a moderate level of digital health knowledge among public health students, are consistent with several investigations conducted within Nepal. For instance, a 2024 study by Regmi A. and Bhandary S. among 34 health professionals in Lalitpur, Nepal, found that 70.59% had a digital health literacy(8), suggesting that a foundational knowledge exists among professionals in the country. Our results expand on this by demonstrating a slightly higher, knowledge base among the next generation of public health professionals, reinforcing the notion that engagement with digital health concepts is becoming increasingly common in the Nepalese health sector.

Similarly, research focused on health professional trainees in Nepal corroborates our findings. A 2019 cross-sectional study conducted by Sharma S, Oli N, Thapa B. among nursing students in Kathmandu Medical College Teaching Hospital, Nepal revealed a 44.7% perceived that they had average Internet skills, 65.1% found the Internet useful in helping them make decisions about their health.(21) This aligns with our study's mean knowledge score of 79.69% and supports the conclusion that health science students in Nepal are acquiring a functional understanding of digital health, likely through a combination of personal use and informal learning, even in the absence of structured academic instruction.

Internationally, our results align with some findings while contrasting with others. A 2024 study by Liu et al. in Hunan Province, China, found a comparable moderate level of digital health literacy (mean score of 74.78 out of 100) among undergraduate nursing students (22), suggesting a common baseline for health science students in the region. However, this is in contrast to findings from a 2022 study by Baumgartner et al. at the Medical University of Vienna, Austria, where medical students demonstrated a lower level of knowledge, understanding on average only about one-third of the digital health terms presented (24). This indicates that competency levels can vary significantly by region and educational system.

While the overall knowledge level in our study was moderate, it is notably higher than the foundational gaps identified in earlier Nepalese research. A 2016 study by Pokharel et al. at the B P Koirala Institute of Health Sciences in Dharan, for example, found that a quarter of participating medical and dental interns were unsure about the usefulness of online health resources and lacked the skills to differentiate between high- and low-quality information (29). The higher proficiency observed in our cohort may reflect a general increase in digital exposure and skills among students in the years since that study was conducted.

A critical and distinctive finding of our research is the significant discrepancy between the students' moderate-to-high knowledge and their exceptionally low level of formal exposure to digital health. An overwhelming majority of students (91.3%) reported low prior exposure through their curriculum, formal training, or online courses, and no statistically significant association was found between their knowledge and this formal exposure. This suggests that students are predominantly acquiring their digital health knowledge through informal channels such as self-directed learning and general internet use, rather than through their academic programs.

This conclusion is strongly supported by other studies. The previously mentioned 2022 Austrian study by Baumgartner et al. found that digital health knowledge did not increase with the year of study, leading to the inference that it was acquired outside the formal curriculum (24) Further corroborating this point, a 2022 study by Kunwar et al. on Nepalese medical students from Tribhuvan University and National Medical College noted that while students understood the importance of telemedicine, very few had received any formal training (25). Similarly, a 2021 study by Hassan et al. at Cairo University found that Egyptian medical students demonstrated high technology adoption but lacked the formal skills to properly search and evaluate online health information (23).

When examining specific knowledge domains, our study identified Telehealth as the least understood area (65.02% mean score). This aligns directly with the 2022 findings of Kunwar et al., who reported that although medical students in Nepal were aware of telemedicine's importance, most were dissatisfied with its current practice and lacked formal education on the topic (25). This points to a systemic gap in structured telehealth

education across health disciplines in Nepal. In contrast, the high proficiency in Wearable Devices (86.18%) observed in our study likely reflects students' familiarity with consumer-facing technologies, acquired through personal interest and use rather than academic instruction.

Finally, our analysis revealed that socio-demographic factors including age, family income, gender, and prior educational background were significantly associated with digital health knowledge. This is a recurring theme in the literature. For example, the 2024 study in China by Liu et al. and a 2024 study by Aydınlar et al. at Acibadem University in Istanbul, Turkey, have also reported that factors such as academic performance and gender can influence digital health literacy levels (22,32). This reinforces the understanding that access to resources and socio-cultural factors play a vital role in shaping the informal learning that currently underpins students' digital health competence.

In summary, while the level of digital health knowledge among public health students in Nepal is comparable to that of their peers in other countries, this study's primary contribution is the clear demonstration that this knowledge is largely disconnected from formal education. This points to a significant gap and an opportunity for the Bachelor of Public Health curriculum in Nepal. Educational institutions must move to formalize digital health training, building upon the informally acquired knowledge of students to equip the next generation of public health professionals with the validated, critical skills needed to navigate the future of healthcare.

5.3 Limitations of the Study

This study has several limitations that should be considered when interpreting the results. First, the use of a purposive sampling technique may have introduced selection bias, potentially limiting the generalizability of the findings to all BPH students in Nepal.

Second, the survey was online, students without good internet couldn't participate. This means our results likely favor students who are already comfortable with technology.

Third, the knowledge assessment was based on multiple-choice questions, which may not fully capture the depth of the students' understanding.

Finally, the cross-sectional design of the study provides a snapshot in time and does not allow for an analysis of how students' knowledge evolves throughout their academic journey.

CHAPTER-6: CONCLUSION AND RECOMMENDATIONS

6.1 Conclusion

This study was undertaken to assess the knowledge of digital health and its associated factors among undergraduate public health students in Nepal, aiming to gauge the preparedness of the nation's future public health workforce. The research revealed a significant paradox: while students possess a moderate overall knowledge of digital health, particularly in consumer-oriented domains like wearable devices, this understanding is largely disconnected from their formal academic training. The key finding is that an overwhelming majority of students have minimal-to-no formal exposure to digital health concepts within their curriculum, suggesting their knowledge is primarily self-acquired through informal channels. The study further identified that higher knowledge levels are significantly associated with non-academic factors, including older age, higher family income, and a pre-university background in science, underscoring the role of personal resources and prior education in this informal learning process.

The primary implication of these findings is that Nepal's Bachelor of Public Health (BPH) programs are not yet systematically equipping students with the critical competencies required to navigate the modern, technology-driven public health landscape. This educational gap poses a risk to the effective implementation of national strategies such as the Digital Nepal Framework and the e-Health Strategy, which depend on a digitally proficient workforce. While students demonstrate a foundational, informally acquired knowledge, it lacks the structure, depth, and critical validation that formal education provides. The limitations of this study include the potential for selection bias due to the use of convenience sampling and a web-based survey, the limited depth of assessment inherent in multiple-choice questions, and the static nature of its cross-sectional design. Nevertheless, this research clearly illuminates a critical disconnect between national health priorities and professional training. As Nepal advances its digital health ecosystem, bridging this gap is not merely beneficial but essential to ensure the next generation of public health leaders can effectively harness technology to improve health equity and outcomes for all.

6.2 Recommendations

Following the conclusions drawn from the study's findings, the following recommendations are proposed to address the identified gaps in digital health education and to better prepare future public health professionals in Nepal.

1. All universities offering a BPH program should develop and integrate a mandatory, credit-bearing course focused on digital health. This course should cover foundational concepts, practical applications (telehealth, mHealth, EHRs), data ethics, and the national digital health strategy.

2. A collaborative body should define a set of core digital health competencies that all public health graduates in Nepal are expected to achieve. These standards should guide curriculum development across all universities.

3. A longitudinal study should be conducted to track a cohort of BPH students from their first to final year, assessing how their digital health knowledge and skills evolve throughout their academic program.
4. Future research should employ qualitative methods, such as interviews and focus groups, to explore in-depth how students are currently acquiring their digital health knowledge outside the classroom.
5. The scope of this research should be broadened to include students from other health science fields, such as medicine, nursing, and pharmacy.

REFERENCES

1. Digital health EURO [Internet]. [cited 2025 Feb 10]. Available from: https://www.who.int/europe/health-topics/digital-health#tab=tab_1

2. CDC Global Digital Health Strategy. 2021;(May 2022). [cited 2025 Dec 21]

3. WHO-ITU. WHO-ITU Global Standard for accessibility of telehealth service. cited 2025 Dec 21]

4. Global Strategy on Digital Health 2020-2025. World Health Organization; 2021. cited 2025 Dec 21]

5. WHO AFRICA REGION [Internet]. [cited 2025 Feb 22]. mHealth: New horizons for health through mobile technologie | WHO | Regional Office for Africa. Available from: https://www.afro.who.int/publications/mhealth-new-horizons-health-through-mobile-technologie

6. Kang HS, Exworthy M. Wearing the Future—Wearables to Empower Users to Take Greater Responsibility for Their Health and Care: Scoping Review. JMIR Mhealth Uhealth [Internet]. 2022 Jul 1 [cited 2025 Feb 22];10(7):e35684. Available from: https://pmc.ncbi.nlm.nih.gov/articles/PMC9330198/ doi: 10.2196/35684

7. ISO - Electronic health records explained [Internet]. [cited 2025 Feb 22]. Available from: https://www.iso.org/healthcare/electronic-health-records

8. Regmi A, Bhandary S. Factors associated with digital health literacy and attitude towards use of digital health technology among health workers of selected municipalities of Lalitpur district: a mixed method study: Digital health literacy among health workers. Journal of General Practice and Emergency Medicine of Nepal [Internet]. 2024 Jul 14 [cited 2025 Feb 1];11(17):52–7. DOI: https://doi.org/10.59284/jgpeman256 Available from: https://jgpemn.org.np/jgpemn/index.php/jgpemn/article/view/256

9. What is digital health technology and what can it do for me? 2022 Sep 27 [cited 2025 Feb 22]; Available from: https://evidence.nihr.ac.uk/collection/what-is-digital-health-technology/

10. Digital technologies directly benefit 70 percent of SDG targets, say ITU, UNDP and partners | United Nations Development Programme [Internet]. [cited 2025 Feb 15]. Available from: https://www.undp.org/press-releases/digital-technologies-directly-benefit-70-percent-sdg-targets-say-itu-undp-and-partners

11. Parajuli R, Bohara D, KC M, Shanmuganathan S, Mistry SK, Yadav UN. Challenges and opportunities for implementing digital health interventions in Nepal: A rapid review. Front Digit Health [Internet]. 2022 Aug 25 [cited 2025 Jan 6];4:861019. Available from: https://pmc.ncbi.nlm.nih.gov/articles/PMC9480345/ doi: 10.3389/fdgth.2022.861019

12. Digital health system in Nepal [Internet]. [cited 2025 Jan 6]. Available from: https://kathmandupost.com/columns/2024/10/09/digital-health-system-in-nepal

13. Ramesh E, Subedi R. Digital Health Presentation. 2024. [cited 2025 Jan 6].

14. Kasaju S, Hossain F, Ruma J, Shirin A. Prospect of Digital Healthcare Initiatives in Nepal Towards Achieving SDG 3. [cited 2025 Jan 6].

15. Public Health 101 Series Instructor name Title Organization. [cited 2025 Jan 6].

16. BPH in Nepal: Programs, Eligibility and Offering Colleges - Edusanjal [Internet]. [cited 2025 Feb 23]. Available from: https://edusanjal.com/degree/bph/

17. CURRICULUM (Revised) BACHELOR OF PUBLIC HEALTH (BPH) of PU. [cited 2025 Jan 6].

18. Bachelor of Public Health OF PoU. 2016. [cited 2025 Jan 6].

19. IOM_BPH Syllabus_ Public Health Update. [cited 2025 Jan 6].

20. Global Digital Health Market Size, Top Share, CAGR of 17.34%, Forecast 2032 [Internet]. [cited 2025 Feb 23]. Available from: https://straitsresearch.com/report/digital-health-market

21. Sharma S, Oli N, Thapa B. Electronic health-literacy skills among nursing students. 2019 [cited 2025 Jan 6]; Available from: http://doi.org/10.2147/AMEP.S207353

22. Liu L, Fu M, Wu J, Wang H, Zhao J, Chen P, et al. Digital health literacy among undergraduate nursing students in China: associations with health lifestyles and psychological resilience. BMC Med Educ [Internet]. 2024 Dec 1 [cited 2025 Jan 4];24(1):1139. Available from: https://pmc.ncbi.nlm.nih.gov/articles/PMC11476067/ doi: 10.1186/s12909-024-06075-w

23. Hassan R, Elsalamony OK, Abdel-Aziz S, Fathelbab M, Sabry HA. Digital health usage and awareness among medicalstudents: A survey study. Open Access Maced J Med Sci [Internet]. 2021 Jan 10 [cited 2025 Jan 4];9:867–71. Available from: https://www.researchgate.net/publication/355308432_Digital_Health_Usage_and_Awareness_among_MedicalStudents_A_Survey_Study doi: 10.3889/oamjms.2021.7007

24. Baumgartner M, Sauer C, Blagec K, Dorffner G. Digital health understanding and preparedness of medical students: a cross-sectional study. Med Educ Online [Internet]. 2022 Dec 31 [cited 2025 Jan 6];27(1). Available from: https://www.tandfonline.com/doi/abs/10.1080/10872981.2022.2114851

25. Kunwar B, Dhungana A, Aryal B, Gaire A, Adhikari AB, Ojha R. Cross-sectional study on knowledge and attitude of telemedicine in medical students of Nepal. Health Sci Rep [Internet]. 2022 Mar 1 [cited 2025 Feb 22];5(2):e532. Available from: https://pmc.ncbi.nlm.nih.gov/articles/PMC8855682/ doi: 10.1002/hsr2.532

26. Vithalani A, Barot PA, Shukla AB, Patel H, Dave DJ. Knowledge, Perception and Practice of Telemedicine among Undergraduate Medical Students at a Tertiary Care Teaching Hospital-NC-SA 4.0 license. Available from: www.graphpad.com.

27. Jembai JVJ, Wong YLC, Bakhtiar NAMA, Lazim SNM, Ling HS, Kuan PX, et al. Mobile health applications: awareness, attitudes, and practices among medical students in Malaysia. BMC Med Educ [Internet]. 2022 Dec 1 [cited 2025 Jul 3];22(1):1–14. Available from: https://bmcmededuc.biomedcentral.com/articles/10.1186/s12909-022-03603-4 doi: 10.1186/s12909-022-03603-4

28. Khan H, Waqas S, Golani S, Kadir MM, Ashraf M. Perceived Usefulness of Smartphone Medical Apps As Theoretical and Clinical Learning Aids Among Medical Students in Pakistan: A Cross-Sectional Study. Cureus [Internet]. 2023 Jul 11 [cited 2025 Jul 3];15(7). Available from: https://pubmed.ncbi.nlm.nih.gov/37575774/ doi: 10.7759/cureus.41682

29. Pokharel PK, Budhathoki SS, Pokharel HP. Electronic Health Literacy Skills among Medical and Dental Interns at B P Koirala Institute of Health Sciences. JNHRC. 14(3).

30. Mufti M, Amin Y, Professor A, Resident S, Senior Resident N. Knowledge, Attitudes and Practice Regarding the Use of smart phones and wearable Devices in Healthcare: A Comprehensive Evaluation. International Journal of Life Sciences. 2024;13(11).

31. Bardus M, Borgi C, El-Harakeh M, Gherbal T, Kharroubi S, Fares EJ. Exploring the use of mobile and wearable technology among university student athletes in lebanon: A cross-sectional study. Sensors. 2021 Jul 1;21(13). doi: 10.3390/s21134472

32. Aydınlar A, Mavi A, Kütükçü E, Kırımlı EE, Alış D, Akın A, et al. Awareness and level of digital literacy among students receiving health-based education. BMC Med Educ [Internet]. 2024 Dec 1 [cited 2025 Jan 4];24(1):38. Available from: https://pmc.ncbi.nlm.nih.gov/articles/PMC10773083/ doi: 10.1186/s12909-024-05025-w

APPENDIXES

A. Informed Consent Form

Namaste! I Dipesh Shrestha student of BPH 4th Year from Purbanchal University School of Health Sciences, Gothgaun, Morang. As per the requirement of the course, I am carrying out a research entitled "Knowledge of Digital Health Among Undergraduate Public Health Students of Nepal". This is completely an academic work and the importance of this study depends on your valuable answers. Your privacy will always be secured and information you provide does not affect it. It is voluntary and you can leave the interview at any time if you wish to. I hope for your participation.

Would you like to participate?

1. Yes 2. No

Interviewer's Name:

Date:

B. Data Collection Tools (Questionnaire)

Section 1: Socio-Demographic Information

1. Name:

2. Age:

3. Gender: a. Male b. Female

4. Name of University:

5. Socioeconomic Status (SES):

5.1 Parental Education:

a. Neither parent has completed secondary education
b. One parent has completed secondary education
c. Both parents have completed secondary education or higher

5.2 Current Place of Residence:

a. Rural Municipality
b. Municipality
c. Sub-Metropolitan City
d. Metropolitan City

6. Family Monthly Income

a. < 10,000
b. 10,000 – 20,000
c. 20,000 – 30,000
d. 30,000 +

6. Educational Background:

a. +2 Science
b. Diploma in Health Sciences

7. Academic Year:

a. 1st Year
b. 2nd Year
c. 3rd Year
d. Final Year

Section 2: Prior Exposure to Digital Health

8. Inclusion of Digital Health in Your BPH Curriculum:

a. Not included
b. Partially included (mentioned in a course)
c. Fully included (dedicated course/module)

9. Formal Training in Digital Health:

a. No formal training
b. Yes (participated but not certified)
c. Yes (certified training)

10. Online Courses on Digital Health:

a. None
b. Completed 1 course
c. Completed ≥2 courses

Section 3: Digital Health Knowledge Assessment

(For each question below, please select the most appropriate answer.)

Section I: Digital Health Knowledge

12. Which statement best defines the broad field of 'digital health'?

a. The professional use of social media by doctors to share health tips.
b. The application of information and communication technologies (ICT) across the entire spectrum of health and healthcare delivery.
c. The process of completely replacing all traditional healthcare services with automated technology.
d. The specific practice of digitizing paper-based patient records into PDF files.

13. Which of the following are all considered key components of the digital health ecosystem?

a. Only hospital administration software and billing systems.
b. Only social media and health-focused television shows.
c. Telehealth, mHealth, wearable devices, and Electronic Health Records (EHRs).
d. Traditional medicine practices and printed health journals.

14. How does digital health most significantly support the core principles of public health?

a. By focusing only on treating individual patients after they get sick.

b. By applying technological innovations to improve health results for the whole population.

c. By replacing the need for public health organizations and community efforts.

d. By limiting healthcare access to only those with advanced technical skills.

15. How does digital health contribute to epidemic control and surveillance?

a. By eliminating the need for vaccines
b. Through real-time data collection, analysis, and reporting
c. By replacing all laboratory tests
d. Through solely manual record-keeping

16. Which factor is often cited as a major barrier to digital health adoption in rural Nepal?

a. High smartphone ownership
b. Strong internet infrastructure
c. Limited digital literacy among users and providers
d. Overabundance of healthcare workers

Section II: Telehealth

17. What do you understand by telehealth?

a. The practice of medicine using telecommunication technology to provide clinical care from a distance, primarily involving real-time video calls between a doctor and patient.

b. A broad field that uses telecommunications to deliver health care, health education, and health information services, both clinically and non-clinically.

c. The use of electronic health records (EHRs) and other patient data between different healthcare institutions.

d. The use of mobile devices for the purpose of personal health and wellness tracking by an individual.

18. Which of the following scenario is the example of telehealth?

a. A doctor accessing a patient's digital health record from a different hospital before an in-person appointment.

b. A health worker in a rural health post consulting a specialist in a city hospital via video call.

c. A public health officer sending an automated SMS reminder to a community about an upcoming vaccination camp.

d. A medical student watching a pre-recorded surgical procedure online as part of their training.

19. What is a key advantage of implementing telehealth in Nepal’s geographically challenging rural areas?

a. Enhancing healthcare access and reducing health disparities for remote and underserved populations.

b. Increasing the personal convenience for individual patients by eliminating their need to travel for every appointment.

c. Facilitating the transition from paper-based medical records to more efficient Electronic Health Record (EHR) systems.

d. Guaranteeing superior health outcomes for all chronic conditions compared to traditional in-person care.

20. Which challenge is particularly significant for sustaining telehealth services in remote, mountainous regions of Nepal?

a. Consistently high-speed internet connectivity
b. Ease of patient transportation
c. Frequent power outages and unreliable electricity supply
d. An oversupply of highly qualified telehealth specialists

21. Which of the following is a critical ethical concern in telehealth?

a. Increasing healthcare jobs
b. Patient data privacy and confidentiality
c. Use of traditional medicine
d. Video call quality

Section III: mHealth

22. What do you understand by mhealth?

a. Hospital-based desktop computer networks and landline phones.
b. Mobile devices (like smartphones, tablets) and wireless technologies
c. health education materials like posters and brochures.
d. Health-related programs broadcasted on national television and radio

23. How can mHealth improve health outcomes?

a. By replacing all necessary in-person clinical checkups
b. Providing timely reminders for appointments and health tips
c. Reducing the cost of health care services
d. Eliminating the need for trained midwives or health workers

24.The strategic focus of mHealth is primarily on:

a. Developing expensive, luxury health apps for a small segment of the population.
b. Using mobile technologies to strengthen health systems and achieve public health goals.

c. Banning the use of personal mobile devices inside all clinic premises.
d. Creating complex games to make health education more entertaining.

25. Which of the following is a primary application of mHealth in public health surveillance?

a. Performing remote surgeries using a smartphone camera.
b. Enabling community health workers to report infectious disease symptoms in real-time using a simple mobile form.
c. Replacing laboratory tests for confirming diseases like malaria or dengue.
d. Dispatching ambulances based on GPS location only.

26. What is the significant challenge of mhealth in context of Nepal?

a. Ensuring the app functions on both Android and iOS platforms.
b. The fact that most Nepalis do not own a mobile phone.
c. The need for content to be available in multiple local languages and be culturally appropriate.
d. The high cost of sending a single SMS message.

Section IV: Wearable Devices

27. Wearable devices in health are commonly used to monitor ?

a. The exact nutritional content of meals consumed.
b. Daily physical activity (step count), heart rate, and sleep patterns.
c. ABO blood group type
d. The presence of specific bacteria or viruses in the body.

28. What is a common limitation associated with the data obtained from consumer wearable devices?

a. Consistently high accuracy
b. Dependence on correct usage and compliance by the individual
c. The inability to collect data in real-time
d. They require a doctor's prescription to purchase and use.

29. Which wearable device is best for people suffering from non-communicable disease to manage their condition?

A) Virtual Reality Headsets

b. A smartwatch that checks your heart and the oxygen in your blood

C) Smart Rings that track sleep

D) Augmented Reality Glasses

30. How do wearable devices help in preventive healthcare?

a. By providing definitive diagnoses for complex diseases
b. Encouraging self-monitoring of physical activity and vital signs
c. Replacing the need for all routine hospital or clinic visits
d. Offering guaranteed cures for chronic health conditions

31. In the context of Nepal, the widespread adoption of health-related wearable technology is often hindered by:

a. income across the population
b. Lack of awareness, affordability, and perceived utility
c. Universal access to advanced diagnostic facilities
d. Government subsidies for purchasing devices

Section V: Electronic Health Records (EHRs)

32. What do you understand by Electronic Health Record (EHR)?

a. A paper-based folder containing a patient's historical charts
b. A secure, real-time, digital repository of a patient's comprehensive health journey
c. A public website where anyone can look up a person's medical history.
d. Standardized insurance claim submission forms

33. What is a key advantage of using EHRs in a healthcare system?

a. It makes patient health information available only to the patient themselves.
b. It increases the amount of paper that hospitals need to store securely.

c. It improves the coordination and continuity of care, as authorized providers can access a patient's history.
d. It requires patient data to be manually re-entered every time they visit a new clinic.

34. The District Health Information Software 2 (DHIS2) system, used in Nepal, is primarily an example of:

a. A direct-to-patient video consultation app.
b. A national-level health information management system for collecting and analyzing aggregated health data.
c. A wearable fitness device distributed by the government.
d. An advanced robotic tool used for performing surgeries.

35. What does ‘interoperability’ mean?

a) The policy of keeping a patient's data isolated within a single hospital's system to ensure privacy.
b) The ability of different EHR systems from different hospitals or clinics to securely exchange and use health information.
c) A feature that restricts EHR access to only one specific software company.
d) The requirement for all healthcare staff to have exceptional computer programming skills.

36. Which factor poses a significant challenge to the successful implementation and maintenance of EHRs, particularly in resource-limited settings like parts of Nepal?

a. Exceptionally high digital literacy rates among all healthcare staff
b. Limited or unreliable digital infrastructure in rural areas
c. An overabundance of funding specifically allocated for EHR projects
d. Significant overstaffing in primary healthcare facilities

Thank you for your participation

C. Work Plan (Gantt Chart)

S.N.	Activities	Falgun 2081	Chaitra 2081	Baisakh 2082	Jestha 2082	Ashad 2082	Shrawan 2082	Bhadra 2082	Ashoj 2082	Kartik 2082	Mangsir 2082
1	Literature Review										
2	Topic Selection										
3	Proposal Writing										
4	Proposal Presentation										
5	Tool Development										
6	Pretesting of the tools										
7	Data collection										
8	Data Entry										
9	Data Analysis										
10	Report writing										
11	Report Submission										
12	Final defense of the report										

D. Map of Study Area

E. Institutional Review Committee (IRC) Approval Page

PURBANCHAL UNIVERSITY
SCHOOL OF HEALTH SCIENCES

Institutional Review Committee

Gothgaun, Morang, Nepal

Ref No: IID-082/83 **Date: 07-09-2025**

Mr./Ms. Dipesh shrestha
Principal Investigator
Purbancha' University School of Health Sciences, Gothgaun, Morang

Subject: Ethical approval of proposal entitled "Knowledge on Digital Health and Its Associated Factors Among Undergraduate Public Health Students of Nepal"

Dear Shrestha,

I am pleased to inform you that your research proposal entitled **"Knowledge on Digital Health and Its Associated Factors Among Undergraduate Public Health Students of Nepal"** was reviewed by committee meeting held on 05-09-2025 and given ethical approval.

Any significant changes in methodology or any other content should be immediately informed to PUSHS-IRC along with the reasons form such changes. You are requested to submit the progress report by the first half of the stipulated duration.

With Best Wishes.

Sushil Regmi
Member-Secretary