



Bhutan Insights Journal

An Educational Journal

July | 2026 | Volume 2 : Issue 1

**From Knowledge to
Entrustment:
Inspiring
Innovation,
Integrity, and
Nation Building.**



Editorial:

Journey from Knowledge to
Entrustment for Innovation
Education in 21st Century Bhutan



Perspective:

Advancing Bhutan's Education



Research article:

Knowledge and practice of wound care
among nurses in Jigme Dorji Wangchuck
National Referral Hospital in Bhutan

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ISSN (Online) : 3136-2532

ISSN (Print) : 3136-2524

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Table of content

Editorial

Journey from Knowledge to Entrustment for Innovative Education in 21st Century Bhutan

Thakur S Powdyel

Research Article

Knowledge and practice of wound care among nurses in Jigme Dorji Wangchuck National Referral Hospital in Bhutan

Chewang Dorji, Dipsika Rai, Thinley Dema, Sangay Chozom, Wang Gyeltshen, Kinley Tshering, Rinchen Pelden, Pema Choden, Tashi Choden

Performance of Colposcopy for the Diagnosis of Histologic CIN2⁺ among Pap Smear Screen-Positive Women in a Camp Setting at Paro Hospital, Bhutan in 2021

Namkha Dorji¹, Tshering Wangden¹, Sonam Choden², Sangay Tshering³, Meera Chhetri

Review Article

Education Policy Reform in South Asia: A Comparative Analysis of India's National Education Policy 2020 and Bhutan's National Education Policy 2024

Rahul Ghosh¹, Alok Gardia

Enhancing Non-Communicable Disease Control: Implementation Experiences of the Service with Care and Compassion Initiative Across Four Districts in Bhutan

Karma Tenzin, Arpita Pradhan, Tandin Deki, Thinley Tobden, Kiran Gurung, Sherub Dorji, Kinley Dorji, Pema Lethro, Karchung Dukpa Tshewang Lhadon

Perspective

Advancing Bhutan's education

Chewang Rinzin



Journey from Knowledge to Entrustment for Innovative Education in 21st Century Bhutan

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Every generation is a trustee of the collective wisdom of preceding generations, even as it seeks to discover ever newer frontiers of knowledge and challenge the limits of human curiosity against the infinite possibilities of the universe that beckon the seeker and the dreamer. The progress of humanity is, thus, a function of the creative interplay between the gift and goodwill of our predecessors in diverse fields of human endeavour and the fruit of innovation and enterprise offered by the inquisitive genius of our successors. The quality and integrity of the relationship between the legacy of time-tested wisdom traditions and the contributions of novel experiments, explorations, inventions, and discoveries will determine the success and sustainability of the human race against the backdrop of active social, scientific, philosophical, ethical, and planetary boundaries.

The founding of societies, raising of families, building of nations, launch of satellites, floating of ocean-liners, conventions of signs and symbols, agreement on weights and measures, as indeed the setting up of the United Nations Organisation and signing of international agreements, for instance, are all a tribute to the marvels of human genius and symbols of goodwill and trust. The Code of Zhabdrung, the Genja of 1907, launch of development plans, introduction of internet and television, proclamation of democracy and the building of GMC are among the most consequential actions built on trust.

“Knowledge has to be taken with a pinch of the proverbial salt! We may have Faustian science and Faustian technology, but could merrily miss the Faustian music.”

The farsighted monarchs of Bhutan have been our best educators and bold reformers, guiding a deeply inward-looking, reclusive country out of the shadows of self-chosen isolation and equipping it with the requisite wherewithal of a dynamic, modern nation-state prepared to play its role as an important member of the global community of nations. The introduction of a modern, western-style English medium education system, setting up of schools and institutions across the country from extended classrooms to universities and providing free education to all children and youth from pre-primary to higher education levels, at home and beyond,

has been a true index of the royal affirmation of the power of knowledge and a mark of infinite trust.

Affirmation, entrustment, and wise counsel have been the hallmark of our sovereigns’ relationship with their citizens throughout their reigns. A royal message from His Majesty King Jigme Singye Wangchuck on the occasion of Sherubtse’s Silver Jubilee celebration in 1993, to cite an example, speaks directly to the youth:

The destiny of our country lies in the hands of our younger generation, and as the cream of our youth, the students of Sherubtse College must play a progressive role and shoulder the responsibility of shaping the destiny of our country. I place my full faith in all of you and have the highest expectations that each and every one of you will serve your country with love, loyalty and dedication.

With full knowledge of the pitfalls attendant upon the introduction of the internet in 1999, as indeed the system of democracy in 2008, Drukgyal Zhip still trusted His citizens to exercise wisdom and choose well. Bhutanese children and youth have the benefit of being educated at state cost for extended periods of time to enable them to acquire knowledge in various fields at home and abroad. The knowledge of science and mathematics, humanities and social studies, IT and AI, sports and music, commerce and business, among a vast array of subjects, is with us. And, the gains to the society have been clearly visible as the proud products of the country’s efforts have been at the forefront of nation-building at all levels. Bhutan is now largely a knowledge-society.

But, knowledge has to be taken with a pinch of the proverbial salt! We may have Faustian science and Faustian technology, but could merrily miss the Faustian music. We need to be mindful of some of the misdirections of contemporary education. Well-known author and educator, Parker Palmer (1998) points out what he calls the paradoxes in modern education: separation of head from heart, facts from feelings, theory from practice, and teaching from learning. I add: undue emphasis on sharpening of brains and skills and neglect of the need to build faith and character, heightened focus on competition over cooperation, and the un-nerving gap between the amount of information and knowledge vis-à-vis the depth of insight and wisdom which together constitute what may be called the seven blunders of modern education!

We are familiar with Ronald Dore's unsettling warning in his well-known book "The Diploma Disease" (1997) that highlights our obsession with qualification over competency, while Powdyel (2014) hazards the concept of Diplomania to express his anguish over the preponderance of certificates and credentials, degrees and diplomas that do not always measure up to the expected level of proficiency and depth.

These concerns explain why it is important to emphasise the need for integrity in academic pursuits and research outputs. Reinforcing a vital, often ignored, mission of education, Richhart (2002) provides a compelling rationale for cultivating intellectual character – "the overarching conglomeration of habits of mind, patterns of thought, and general dispositions toward thinking that not only direct but also motivate one's thinking-oriented pursuits" in his seminal work of that name. This is a valid reason for institutions of learning to come into being.

There is more! Vandana Shiva (2022) argues that "Education for life has to cultivate our real intelligence which co-creates with the intelligence of other beings and the Earth. Nature becomes our teacher and through Nature, we learn how to cultivate living intelligence, ecological intelligence, co-operative intelligence, compassionate intelligence, and emotional intelligence". This framework recalls Powdyel's eight levels of consciousness as represented in The Sherig Mandala (2014).

The hallowed tradition of higher education and research is built on the essential match between the integrity of the objective world and the steady standard of the subjective ideal. Therefore, credentials and their referents ought to harmonise to support research and learning to be purposeful and worthwhile.

I commend the excellent efforts made by the contributors to this edition of the Bhutan Insights Journal to address some of the consequential gaps in the selected fields of their investigation. For aspiring researchers, I urge them to examine their themes through the well-known Socratic Sieves: Is it true? Is it good? Is it necessary?

With the onslaught of mass media and the relentless call for pragmatism, Bhutan's education system will do well to remain faithful to the country's unique integral self even as we navigate the challenges unleashed by the likes of AI and allied developments. A golden mean ought to be the goal.

On a deeply personal level, I am still under the magical spell of the most powerful expression of entrustment addressed directly to me and my fellow-parliamentarians with extraordinary clarity and regal profundity. It was May 10, 2008, the inaugural day of the historic First Session of the First Parliament of Bhutan. His Majesty Druk Gyalpo Jigme Khesar Namgyal Wangchuck addressed the Parliament and made the most poignant and historic proclamation to mark the country's new journey:

...from this day forth, we place in your hands our unique nation, our greatest treasure in this world...

This is supreme entrustment unprecedented in history and addressed not only to the law-makers gathered in the august Gyalyong Tshokhang but to all Bhutanese citizens, lay and learned, present and future, sovereign to citizens, at home and

beyond in faith and hope.

May we all be worthy of this sacred trust...

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Knowledge and practice of wound care among nurses in Jigme Dorji Wangchuck National Referral Hospital in Bhutan

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ABSTRACT

Wound care is a fundamental aspect of nursing that directly influences patient recovery, safety, and quality of life. Despite its importance, global research highlights a consistent gap between nurses' wound care knowledge and their clinical practice. In Bhutan, however, this issue has received limited research attention. This study aims to assess the wound care knowledge and dressing practices of Bhutanese nurses, identify knowledge and practice gaps, and provide baseline evidence to inform future training and policy interventions. A descriptive cross-sectional study was conducted among 148 nurses (69% female and 31% male) from 12 wards of a Bhutanese hospital. Participants were selected using Yamane's formula and convenience sampling (ref). Data were collected between October and December 2021 using a validated self-administered questionnaire to assess knowledge and a direct observation checklist to evaluate wound care practices. Data were analyzed using Epi-Data software with descriptive statistics and correlation analysis, and a significance level of $p < 0.05$. While 86% demonstrated excellent wound

Keywords: *Wound care, Nursing practice, Knowledge-practice gap, Evidence-based nursing, Bhutan, Wound management, Clinical competence*

INTRODUCTION

Wound care is a fundamental aspect of nursing practice that spans all clinical disciplines and affects patients across different stages of life. It is estimated that approximately 1-2% of the population worldwide has a wound at any given time, although the underlying causes may vary (Falanga et al., 2022). Furthermore, quality of life is significantly impacted by the presence of chronic wounds (Sen, 2021) as they impose a significant clinical and economic burden on healthcare systems. Researchers found that inadequate wound care can lead to delayed healing, increased complications, prolonged hospital stays, and elevated morbidity and mortality rates (Alla et al., 2018; Hasan et al., 2025). As the prevalence of chronic wounds continues to rise, the associated financial strain on health systems intensifies (Sharma et al., 2024), and thus, wound management remains a resource intensive process. In the United Kingdom, the annual cost of wound management has been estimated at between £4.5 and £5.1 billion, reflecting its substantial economic impact (Guest et al., 2015).

Wound care constitutes one of the largest portions of the nursing workload in daily care, representing up to 65% of community nurses' workload and about 50% of primary care nursing responsibilities (Welsh, 2018). Evidence-based wound care enhances healing outcomes, reduces hospital stays, reduces costs, improves patient safety (Lindsay et al., 2017) and supports evidence-based decision making (Adeline & Kathleen, 2022). Existing literature reports mixed findings regarding nurses' knowledge and practice in wound management. Some studies have reported moderate to high levels of wound care knowledge

with scores ranging from 57.8% to 87%, (Bilal et al., 2018) and have shown that knowledge generally improves with increasing years of clinical experience (Tegegne et al., 2022). However, other studies indicate that adequate knowledge does not necessarily lead to effective clinical practice, revealing a persistent gap between knowledge and practice (Builders et al., 2020; Kielo et al., 2020). Study conducted in Finland and Nigeria reported that nurses with good theoretical knowledge often fail to adhere consistently to best wound care practices (Builders et al., 2020; Kielo-Viljamaa et al., 2022). Similarly, a study on pressure ulcer management in Bhutan found that although nurses exhibited good knowledge of pressure ulcer management, their wound care practices were rated as poor in 93.1% of observed cases (Wangmo et al., 2020).

Although sound knowledge is a prerequisite for effective wound management, evidence suggests that practice is influenced by multiple contextual factors such as training, time constraints, institutional support, and workload (Tegegne et al., 2022). Given the scarcity of empirical data in Bhutan, there remains a lack of understanding of nurses' knowledge and practices in wound care. Therefore, this study aims to assess the current level of wound care knowledge and practice among nurses in a Bhutanese hospital and to explore the correlation between the two. As one of the few studies conducted on this topic in Bhutan, It establishes an important baseline to support the development of evidence-based training programs, inform policy interventions and strengthen wound care competency and the quality of nursing practice in Bhutan.

METHODS

This descriptive cross-sectional study was conducted between October and December 2021 in a tertiary hospital in Bhutan. A tertiary hospital is a health care center where specialized care is provided to patients with complex cases requiring advanced technology, expertise and multi-disciplinary team. The study targeted nurses working in wards and units directly involved in wound care management. Wards providing wound care services were identified from the hospital's inpatient departments (IPDs) and the outpatient departments (OPDs). A total of 12 areas were involved in wound care services from the existing 19 different areas of work. The 12 areas were Medical Ward, Medical Extension Ward, Eye Nose and Throat (ENT) Ward, Cabin, Adult Intensive Care Unit (AICU), Maternity Ward, Surgical Ward, Epidural Ward, Orthopaedic Ward, Paediatric Ward, Paediatric Intensive Care Unit (PICU), and OPD Dressing Room.

Participants were recruited using a non-probability convenience sampling method. The required sample size was determined using Yamane's formula (1967) with a 95% confidence level for a known population size, " $n = N/(1+N \cdot e^2)$ "; where, n is the required sample size, N is the total population size, e is the margin of error, or desired level of precision, expressed as a decimal (0.05 at 95% confidence level)". As per Yamane's formula, the minimum calculated sample size was 112, however we recruited 148 nurses to account for potential incomplete data. As no non-response or incomplete data identified, all 148 participants were included in the final analysis.

Research Instruments

The researchers developed a Demographic Data Questionnaire, a Wound Care Knowledge Questionnaire and a Wound Dressing Practice Checklist to collect relevant information that could assess the nurses' knowledge and skills in wound care. The Demographic Data Questionnaire was used to collect participant's demographic data, including age, gender, qualification, professional category, years of experience, work area and prior wound care training (Bilal et al., 2018; Tayyib & Ramaiah, 2021). The Wound Care Knowledge Questionnaire was developed based on a review of relevant literature (Kielo-Viljamaa et al., 2022; Kielo et al., 2020; Hinkle & Cheever, 2014). It consisted of 20 multiple choice questions and was validated by 9 experts, resulting a content validity index of 0.8 (Polit & Beck, 2021). The Wound Dressing Practice Checklist was adapted from the Faculty of Nursing and Public Health, Khesar Gyalpo University of Medical Sciences. The questionnaire was then pilot tested with 20 nurses of varying levels of wound care experience from the selected wards and units for reliability and it was found to be reliable.

Data Collection and Analysis

The research was approved by the Research Ethics Board of Health and Policy (REBH/Approval/2021/071) and the Planning Division, Ministry of Health. Permission to conduct the research was obtained from the participating hospital (JDWNRH/MERU/01/2020-2021/3129), and the informed consent was

obtained from all the nurses who met the inclusion criteria and were willing to participate in the study voluntarily. Data was collected every day, until a total of 148 participants were recruited. An additional data from 20% of the participants was collected to address missing information and questionnaires with missing data were excluded from analysis. Descriptive statistics were used to describe demographic characteristics, and correlation analysis was performed to examine the relation between knowledge and practice on wound care. The level of statistical significance was set at $\alpha = 0.05$.

RESULTS

Participant Characteristics

A total of 148 nurses participated in the study. The majority were female (69%, $n = 102$), while 31% ($n = 46$) were male. The predominant age group was 26–30 years (43%, $n = 63$), followed by 20–25 years (26%, $n = 39$) and 31–35 years (24%, $n = 36$). A smaller proportion of participants were aged 36–40 years (2%, $n = 3$) and above 40 years (5%, $n = 7$). With respect to professional experience, nearly two-thirds of the participants (64%, $n = 94$) had 0–5 years of work experience, followed by 25% ($n = 37$) had 6–10 years, 5% ($n = 8$) had 11–15 years, and 3% each ($n = 4$ and $n = 5$) had 16–20 years and more than 20 years of experience, respectively. In professional category, staff nurses represented the majority (62%, $n = 92$), followed by clinical nurses (28%, $n = 41$) and assistant nurses (10%, $n = 15$). Participants were recruited from a wide range of work area providing wound care services. The largest proportions were from maternity (18%, $n = 26$), surgical (13%, $n = 19$), and orthopedic (13%, $n = 19$) wards. The remaining participants work in medical (11%), medical extension (8%), ENT (6%), cabin (7%), AICU (6%), epidural (6%), pediatric (5%), OPD dressing room (3%), and PICU (4%). Only a few participants (2%, $n = 3$) reported having received any training or continuing medical education (CME) on wound care, while the majority (98%, $n = 145$) had no formal training in wound care.

Knowledge and Practice Levels

The participants' wound care knowledge was assessed using a 20-item questionnaire, with scores classified as Poor (0–5), Average (6–10), Good (11–15), and Very Good (>15). The overall mean knowledge was scored at 10 ($SD = 3$), which indicates an average level of knowledge. More than half of the nurses (52%, $n = 76$) had an average level of knowledge about wound care, while 41% ($n = 61$) showed good knowledge. Only a small number of participants had very good (4%, $n = 6$) or poor knowledge (3%, $n = 5$). Wound dressing practice scores indicated a high level of performance with a mean practice score of 42 ($SD = 3$), indicating a very good standard. Most of the nurses (86%, $n = 128$) achieved very good practice, while the remaining 14% ($n = 20$) demonstrated good practice. Notably, none of the nurses fell into the poor or average categories.

Table 1: Demographic characteristics of the participants

Variable	f	%
Gender		
Male	46	31
Female	102	69
Age(years)		
20-25	39	26
26-30	63	43
31- 35	36	24
36- 40	3	2
>40	7	5
Work experience		
0 – 5 years	94	64
6 – 10 years	37	25
11 – 15 years	8	05
16 – 20 years	4	03
>20 years	5	03
Professional category		
Assistant nurse	15	10
Staff nurse	92	62
Clinical nurse	41	28
Place of work		
Medical	16	11
Medical Extension	12	8
ENT	9	6
Cabin	11	7
AICU	8	6
Maternity	26	18
Surgical	19	13
Epidural	9	6
Orthopedic	19	13
Pediatric	8	5
OPD Dressing Room	5	3
PICU	6	4
Received training/CME on wound care		
Yes	3	2
No	145	98

Between Knowledge and Practice

The Pearson's product correlation revealed no statistically significant relationship between knowledge and practice scores ($p = .108$, $\alpha = .05$). This finding suggests that higher knowledge levels did not necessarily correspond to better practical performance of wound care among this sample.

Knowledge and practice by area of work

The average knowledge scores varied across work areas. The highest scores were observed in the surgical unit ($M = 12$, $SD = 3$), followed by the Adult Intensive Care Unit (AICU) ($M = 11$, $SD = 4$), medical extension ($M = 11$, $SD = 1$), ENT ($M = 11$, $SD = 2$), cabin ($M = 11$, $SD = 3$), and orthopedics ($M = 11$, $SD = 2$). Moderate scores were observed in the medical ($M = 9$, $SD = 2$), maternity ($M = 9$, $SD = 2$), epidural ($M = 9$, $SD = 3$), pediatric ($M = 9$, $SD = 2$), and PICU ($M = 9$, $SD = 2$) units. The lowest average score was found in the OPD dressing room ($M = 8$, $SD = 3$), indicating that nurses in this area have limited understanding of wound care.

Wound care practice scores also varied across clinical areas. Nurses in the Adult Intensive Care Unit (AICU) had the highest average practice score ($M = 45$, $SD = 1$), followed by those in the OPD dressing room ($M = 44$, $SD = 2$), cabin ($M = 43$, $SD = 4$), and pediatric units ($M = 43$, $SD = 3$). High practice scores were also seen in the medical extension ($M = 42$, $SD = 4$), ENT ($M = 42$, $SD = 2$), surgical ($M = 42$, $SD = 3$), epidural ($M =$

Table 2: Knowledge and practice level of the participants

Variable	f	%
Knowledge		
Very Good (>15)	06	04
Good (11-15)	61	41
Average (6-10)	76	52
Poor (0-5)	05	03
Practice		
Very Good (>36)	128	86
Good (25-36)	20	14
Average (13-24)	00	00
Poor (0-12)	00	0

Table 3: Association between knowledge and practice

Variable	Mean	SD	P
Knowledge	10	3	0.108
Practice	42	3	

Table 4: Knowledge level as per the work area

SL No	Area of Work	Range	Mean	SD
1	Medical	7-12	09	2
2	Medical Extension	9-14	11	1
3	Ear Nose and Throat (EENT)	7-13	11	2
4	Cabin	7-15	11	3
5	Adult Intensive care unit (AICU)	7-17	11	4
6	Maternity	5-12	09	2
7	Surgical	8-18	12	3
8	Epidural	6-13	09	3
9	Orthopedic	8-16	11	2
10	Pediatric	7-12	09	2
11	Outpatient Dressing (OPD) Room	4-10	08	3
12	Pediatric Intensive care Unit (PICU)	5-13	09	3

Table 5: Practice level as per work area

SL No	Area of Work	Range	Mean	SD
1	Medical	36-47	41	3
2	Medical Extension	37-46	42	4
3	EENT	40 - 44	42	2
4	Cabin	36 - 47	43	4
5	AICU	44 - 47	45	1
6	Maternity	35-45	41	2
7	Surgical	36 - 46	42	3
8	Epidural	35 - 47	42	4
9	Orthopedic	36 - 44	40	3
10	Pediatric	39-46	43	3
11	OPD Dressing Room	42 - 47	44	2
12	PICU	41 - 45	42	2

42, SD = 4), and PICU (M = 42, SD = 2) units. Meanwhile, the medical (M = 41, SD = 3) and maternity (M = 41, SD = 2) units had moderate practice scores, and the orthopaedic unit had the lowest average practice score (M = 40, SD = 3).

Wound Dressing Practice Assessment

Pre-procedure Phase: The pre-procedure phase consists of seven items assessing on preparation, communication, and aseptic readiness before commencing the actual process of wound care. The mean scores ranged from 1.4 to 2.0, which indicated an overall good practice. The highest compliance was observed for

confirming physician's order (M=2.0) and assisting the client to a comfortable position (M = 1.9) before they commenced wound care. Lower scores were observed for greeting and identifying the patient (M = 1.4) and explaining the procedure to the patient (M = 1.5). These findings suggest that while technical preparation was followed well, interpersonal communication and patient education were comparatively weaker components of pre-procedure practice.

Intra procedure phase: During the intra-procedure phase, nurses were evaluated on 12 key tasks that are central to wound care. These tasks included following aseptic techniques, cleaning the wound properly, and applying dressings accurately. The average scores for these activities ranged from 1.1 to 2.0, showing a high level of adherence to proper wound management practices. Nurses scored the highest in tasks like inspecting wound drainage, preparing a sterile field, applying antiseptic-moistened gauze, and securing the dressing, all with an average score of 2.0. However, they scored lower in tasks such as placing a mackintosh (protective sheet) under the wound (1.1), performing hand hygiene after removing gloves (1.5), and communicating with the patient during the procedure (1.5). Overall, the intra-procedure findings indicated strong competence in aseptic dressing techniques, though aspects of patient engagement could be further strengthened.

Post-procedure Phase: In the post-procedure phase, participants were assessed on five items such as tasks like waste disposal, termination of the used equipment, patient comfort, and documentation. The average scores in this phase ranged from 0.9 to 1.9, with the highest score noted for removing gloves correctly (M = 1.9) and cleaning and replacing articles (M = 1.9), followed by moderate compliance for waste disposal (M =

Table 6: Practice Items Individual scoring

Sl. no	Wound dressing practice items	Mean
Pre Phase		
1	Confirm Physician's order	2.0
2	Greetings, self-introduction and identification of client	1.4
3	Explain the purpose and procedure to the client. Respond to any questions or concern	1.5
4	Wash hands and dry thoroughly	1.7
5	Gather all required articles (sterile and clean articles)	1.7
6	Provide privacy with a screen (in open wards)/ take the patient to intervention room	1.6
7	Assist the client to a comfortable position that provides easy access to the wound area.	1.9

Intra Phase		
8	Place the mackintosh underneath the wound area.	1.1
Sl. no	Wound dressing practice items	Mean
9	Put on a clean glove and remove old dressing carefully. If dressing is stuck, soak it with saline and remove one layer at a time.	1.8
10	Inspect and assess the amount, type and odor of the drainage.	2.0
11	Remove clean gloves and perform hand hygiene.	1.5
12	Open sterile dressing tray and prepare a sterile field and add supplies	2.0
13	Put on sterile gloves.	1.9
14	Clean the wound using strict aseptic technique (CAT method)	1.9
15	Discard used gauze after each stroke and repeat the step using new gauze with each stroke until the wound is clean	1.8
16	Soak plain gauze in antiseptic or plain solution and wring until moist but not dripping.	2.0
17	Apply sterile moistened gauze then cover with dry gauze pad over moistened gauze in sufficient amounts to absorb drainage	1.9
18	Secure the dressing with adhesive tape or bandages	2.0
19	Communicate with the client throughout the procedure	1.5
Post Phase		
20	Before removing gloves, dispose of waste materials as per the infection control and medical waste management protocol	1.7
21	Remove gloves by turning inside out and dispose	1.9
22	Clean and replace all the articles in proper place	1.9
23	Assist clients to a comfortable position	1.6
24	Document in wound assessment and progress note	.9

Table 7: Knowledge and practice in phases

Items	Min	Max	Mean	SD
Pre phase (Practice)	7	14	12.1	1.7
Intra phase (Practice)	16	24	21.5	1.8
Post phase (Practice)	4	10	8.1	1.4
Items	Min	Max	Mean	SD
Knowledge of Wound Healing	2	8	4.0	1.2
Knowledge of Pressure Ulcer	0	4	2.6	.9
Knowledge on Techniques	1	4	2.5	.6

1.7) and assisting the client to a comfortable position ($M = 1.6$). However, lowest score was noted for documenting the wound progress notes ($M = 0.9$), indicating that the record-keeping and documentation is an area that needs significant improvement and critical attention.

The practice phases showed that the nurses were demonstrating high levels of practice across all stages. The intra-procedure phase had the highest mean score ($M = 21.5$, $SD = 1.8$), indicating that the nurses were very thorough in following aseptic techniques, cleaning wounds properly, and accurate dressing application. The pre-procedure phase also showed good results ($M = 12.1$, $SD = 1.7$), especially in verifying doctors' orders, maintaining sterile conditions, and gathering necessary sterile materials. However, the post-procedure phase had a slightly lower average score ($M = 8.1$, $SD = 1.4$), suggesting that activities such as documentation, equipment cleaning, and waste disposal practices were not consistently performed. The assessment of wound care knowledge showed a moderate level of understanding among the participants, with some variation in different areas. The highest mean score was noted for knowledge about wound healing ($M = 4.0$, $SD = 1.2$), while lower scores were noted for pressure ulcer management ($M = 2.6$, $SD = 0.9$) and wound care techniques ($M = 2.5$, $SD = 0.6$). Overall, a small variation in standard deviations and the relatively low mean values were noted.

DISCUSSION

The study evaluated nurses' knowledge and practice of wound care in a hospital in Bhutan and found moderate theoretical understanding but strong practical skills. The majority of the participants were between the ages of 26 and 35. Overall, the participants demonstrated outstanding competency in wound care practice, with strong aseptic technique and dressing during procedures. Pre-operative preparation was generally well performed, whereas the post-procedure documentation, equipment cleaning, and waste management were weaker. These results are consistent with the wound care compliance study conducted by Bilal et al. (2018), who reported that intra-procedure performance was the highest and post-procedure compliance was the lowest. Likewise, Najm & Hussein (2018) identified lower compliance in documentation and infection-control procedures. These similar findings suggest that nurses may often prioritize

the immediate technical aspects of care and pay less emphasis on the follow-up components such as record-keeping and patient comfort.

Additionally, we found overall moderate nurses' wound-care knowledge, with higher scores in areas of wound-healing and lower scores in pressure-ulcer management and wound-care techniques. Furthermore, the lack of a significant correlation between knowledge and practice ($p = .108$) suggests that having more theoretical knowledge did not necessarily lead to better practical performance. This finding aligns with previous research stating that knowledge alone is not a reliable predictor of practice in wound management (Helen N Obilor & Odinaka, 2021; Welsh, 2018). One possible reason for this could be that the wound care is still a relatively new and evolving field in Bhutan, with nurses often acquiring practical skills on-the-job experience rather than through formal specialized training. In this study, only 2% of the nurses reported receiving structured continuing medical education (CME) on wound care. Similar challenges have been observed in other developing countries, where limited access to specialized training hinders evidence-based practices (Lee & Chang, 2023).

Some nurses who scored low in knowledge were observed with better performance at wound care practices and vice versa. This phenomenon might be due to experiential learning, where hands-on experience in wards enhances practical skills due to constant practice despite limited formal knowledge (Najm & Hussein, 2018). On the other hand, the newly trained nurses may have recent theoretical knowledge, but they often lack the confidence needed to perform practical procedures (Kreedi et al., 2021). Bhutan's hospitals have recently introduced structured continuing medical education sessions on wound care during induction programs, which may gradually bridge this gap. Variation in knowledge and practice levels across area of work was observed. It was noted that the nurses in the surgical ward exhibited the highest knowledge scores, likely due to their greater exposure to complex wounds and daily dressing routines which provide them with better opportunity to practice and keep themselves updated theoretically. In contrast, those working in the OPD dressing room had lower knowledge scores. These findings contrasted with that of Najm and Hussein (2018), who found senior nurses generally performed better. In this study, the surgical ward nurses tended to be younger and more recently recruited, while OPD nurses were older and more experienced, which could have led to the differences in the studies. In Bhutan's context, this may reflect the generational differences in training, where younger nurses benefit from updated nursing curriculum that integrates basic wound-care principles. Further, this study partially aligns with the findings from Wangmo et al., (2020) in Bhutan which reported nurses exhibited good knowledge of pressure ulcer management, but their actual wound care practices were rated poor in 93.1% of cases (Wangmo et al., 2020). Together, these findings reinforce the persistent knowledge-practice gap in wound care.

Guided by the broader principles of Gross National

Happiness (GNH) and universal health coverage, the Bhutanese healthcare system emphasizes on the holistic and compassionate care. Yet, as this study suggests, sustaining that vision requires continuous professional development to ensure that the nurses' clinical competence matches the evolving health care demands. The integration of dedicated wound care continuing medical education, coupled with the mentorship from experienced professionals could strengthen both the knowledge and practical competencies (Donovan et al., 2025; Skórka et al., 2021). In addition, the hospitals should emphasize and monitor the use of standardized wound care documentation tools to ensure proper record keeping, and routine clinical and record audits should be performed to enhance procedure compliance (Bunting & de Klerk, 2022). Furthermore, integrating wound management audit into the nursing workplan at the headquarters would help institutionalize wound care audit, eventually expanding its access to training across the districts and reducing the urban-rural skills disparities, and thereby, ensuring equitable patient outcomes in line with Bhutan's national health policy.

Limitations

This study has several limitations. Its cross-sectional design limits the ability to draw conclusions on its cause-and-effect relationships. Additionally, the study's reliance on the observation checklist and self-reported questionnaires could be prone to social desirability and Hawthorne biases. The results of the study are limited in generalizability as the study was conducted in a single hospital setting. Future research could incorporate longitudinal studies, evaluate targeted educational interventions and measure patient outcomes in relation to nurse's competence and wound healing outcomes.

CONCLUSION

This study establishes baseline of understanding the levels of knowledge and practice of wound care among nurses in Bhutan, and highlights a clear gap in the knowledge and practice of wound care. While the Bhutanese nurses display strong practical competence in wound care, they demonstrated moderate theoretical understanding. Addressing this gap will require sustained educational initiatives, structured continuing professional development, supportive supervision and mentorship, and strengthened system-level reinforcement of documentation and infection control protocols. Bhutan's nursing workforce can further enhance the quality, safety and sustainability of patient care by investing in the structured wound care training and professional development of the workforce.

Acknowledgement

The researchers would like to express their sincere gratitude to the Department of Nursing for providing the opportunity and continuous guidance to undertake this study. A heartfelt appreciation is extended to the management and staff of Jigme Dorji Wangchuck National Referral Hospital for their kind cooperation, support, and facilitation throughout the data

collection process. Special acknowledgement to the Ministry of Health and the Research Ethics Board of Health for their invaluable support in granting the necessary approvals and ensuring that all ethical considerations were upheld during this research. Finally, the researchers extend deep appreciation to all the nurses who participated in the study, for their time, honesty, and invaluable contributions, without which this research would not have been possible.

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Performance of Colposcopy for the Diagnosis of Histologic CIN2⁺ among Pap Smear Screen-Positive Women in a Camp Setting at Paro Hospital, Bhutan in 2021

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ABSTRACT

Objectives: Colposcopy camp is a way to reach colposcopy services in the community, reduce the burden on colposcopy centers, and reduce out-of-pocket expenses. This study assessed the sociodemographic profiles, colposcopy performance in diagnosing CIN2⁺, and cervical biopsy results among women who received colposcopy services during the colposcopy camp held at Paro Hospital, Bhutan, in 2021. **Materials and Methods:** This was a retrospective review of records of women with positive Pap smear screen who availed colposcopy services at Paro hospital, Bhutan, between August 30, 2021, and September 7, 2021. Data on sociodemographic characteristics, colposcopy, and histopathology diagnoses were retrieved from records maintained at the colposcopy clinic and the Department of Pathology and Laboratory Medicine, Jigme Dorji Wangchuck National Referral Hospital. Data entry and analysis were performed using SPSS version 25. **Results:** The mean age of study participants was 41 years (SD, 9 years). Among 84 women, 12 (14.3%), 31 (36.9%), and 41 (48.8%) had normal, low-grade lesion (LGL), and high-grade lesion (HGL) on colposcopy, respectively. Thirty-five (41.7%) underwent colposcopy-directed punch biopsy, and 33 (41.7%) underwent LEEP. The colposcopy sensitivity, specificity, and accuracy to diagnose histologic CIN2⁺ were 70.0 %, 56.82 % and 60.94 %, respectively. Whereas the sensitivity, specificity, and accuracy for the diagnosis of histologic CIN 2⁻ were 30.77 %, 56.86%, and 51.56 %, respectively. The overtreatment rate with LEEP was 69.7%. **Conclusion:** The performance of colposcopy to diagnose histologic CIN 2⁺ was better than the diagnosis of CIN2⁻, and the over-treatment rate was high in this colposcopy camp setting.

Keywords: Colposcopy; Pap smear; Uterine cervical neoplasm; Colposcopy camp; LEEP; See and treat; See, triage and treat

INTRODUCTION

Cervical cancer was the fourth most common cancer in women in terms of incidence and mortality with an estimated 604,000 new cases and 342,000 deaths worldwide in 2020 (Sung et al., 2021). It was the most frequently diagnosed cancer in Bhutan, and the leading cause of cancer deaths in women, with an age-standardized incidence rate of 14.4 cases, and mortality rate of 8.3 cases per 1,00,000 persons per year (ICO, 2016; Sung et al., 2021).

In line with the WHO, Bhutan aims to eradicate cervical cancer by 2030 through 90-70-90 triple strategies ("Global Strategy to Accelerate the Elimination of Cervical Cancer as a Public Health Problem," 2020). The conventional Pap smear was used as a cervical cancer screening tool for women aged 25-65

years in Bhutan since 2000 (Baussano et al., 2014). However, Pap smear was replaced by high performance human papillomavirus deoxyribose nucleic acid (HPV DNA) testing from January, 2022. WHO recommends HPV DNA testing as a primary screening tool for cervical cancer (WHO, 2013), and the single visit approach treatment (World Health Organization, 2014). ASCCP 2019 recommends management of screen positive women based on assessment of the immediate risk of cervical intraepithelial neoplasia 3+ (CIN3+)(Perkins et al., 2020). Through the Health Flagship Program by the end of 2023, Bhutan achieved 90-70-90 global targets of eliminating cervical cancer (Dorji et al., 2025).

Colposcopy is an important tool for triaging women with abnormal screen results regardless of any screening methods. Colposcopy helps in identifying the lesions, and making a decision on the timing and mode of treatment- either to

recommend follow-up, take a biopsy for histological diagnosis, or treat with ablative procedures or excisional procedures.

In Bhutan, women with abnormal Pap result underwent colposcopy examination. Colposcopy services are provided routinely in the colposcopy centers as well as in the communities or other health centers in the form of colposcopy camp. As of October 2022, Bhutan has eight colposcopy centers (Figure 2). People from other places need to travel to the nearest colposcopy centers to avail services.

Despite the mountainous terrain, the road connectivity has improved. However, people still face difficulties reaching the colposcopy centers, especially those from rural areas, due to numerous challenges, including high expenses, illiteracy and its associated problems, low awareness about the program, and a high rate of loss to follow-up. A study in Bhutan has shown that clients who are of older age, multiparous, are illiterate, and are housewives and residing in far-flung areas exhibit lower health seeking behavior (Baussano et al., 2017).

One effective solution to the above-mentioned limitation is to bring the colposcopy services to the communities. The community leaders and local health workers compile a list of women in need of colposcopy, and inform them about the availability of services. Doing so encourages the women to arrange for a group transportation facility, and they turn up for the services. Since the services are provided at the door step in one day, their burden on farming and livestock-care due to long distance travel to the colposcopy center is avoided. When such camps are conducted, women in the communities inform and encourage each other and come in groups, thereby increasing the clients' turnover.

Herein, we present the sociodemographic profiles, performance of colposcopy, and results of cervical biopsies (either loop electrosurgical excisional procedure (LEEP) or cervical punch biopsy) among women who availed colposcopy services during a colposcopy camp held at Paro hospital, Bhutan.

Materials and Methods

This was a retrospective review of records of women who underwent colposcopy, colposcopy directed cervical punch biopsy and LEEP procedures during the colposcopy camp conducted at Paro hospital. It was conducted between 30th August and 7th September 2021 by the colposcopy team from JDWNRH, Thimphu. The team consisted of one gynecologist, one colposcopy nurse and operation theatre staff (nurse anesthetist, operation theatre technician, and two scrub nurses). The colposcopist had more than 10 years of experience.

Patients with abnormal Pap smear results were called for colposcopy as per the national cervical cancer screening guidelines (Cervical Cancer Screening Manual 2014, 2014).

The portable video colposcope (proMISCOLpro 222DX-OZview) at 6-12 magnification was used. The standard steps described in the International Agency for Research on Cancer (IARC) manual of colposcopy were followed (Sellors & Sankaranarayanan, 2003), and the colposcopy findings were documented according to the International Federation for Cervical Pathology and Colposcopy (IFCPC) nomenclature, and Swede score calculated (Bornstein et al., 2012; Bowring et al., 2010). Swede score of 0-4 was categorized as low-grade lesion (LGL), 5-10 as high-grade lesion (HGL), and negative acetowhite as normal.

The colposcopy nurse explained about the procedure, potential discomfort, and the need for additional procedures such as biopsy, and LEEP, as well as possible complications of the procedure. Then, thumb imprint and written informed consent were obtained from all the patients who underwent the procedure. Women with LGL in colposcopy underwent colposcopy directed punch biopsies using either Kevorkian or Baby Tischler minibite biopsy forceps. Women with or above "atypical squamous cells-cannot exclude high-grade squamous intraepithelial lesion (ASC-H)" on Pap smear, and/or those with high grade lesion (HGL) on colposcopy underwent treatment with "Loop electrosurgical excisional procedures (LEEP)". Women who were unlikely to return for follow-up were treated with LEEP, irrespective of colposcopy result, at the discretion of the colposcopist.

LEEP was performed under total intravenous anesthesia (TIVA) as per the steps described in IARC manual of colposcopy and treatment of cervical intraepithelial neoplasia: a beginner's manual (Sellors & Sankaranarayanan, 2003).

The patients were educated about anticipated side effects, such as minimal blood stain discharge that may last for 4-6 weeks, to avoid sexual intercourse for 4-6 weeks, and a follow up schedule. Patients were advised to seek medical care if they experience complications such as high-grade fever lasting for more than two days, heavy vaginal bleeding, foul smelling yellowish-green vaginal discharge, and severe lower abdominal pain.

The detailed sociodemographic details, pap results, colposcopy diagnosis and types of procedures (Either punch biopsy or LEEP) were recorded in the colposcopy record register, which was transported and stored at the colposcopy clinic, JDWNRH.

The cervical tissue specimens obtained from the patients evaluated at the colposcopy camp were placed in 10% phosphate-buffered formalin, and transported to the Department of Pathology and Laboratory Medicine, JDWNRH. The slides were constructed from 3 mm sections of formalin-fixed paraffin-embedded (FFPE) blocks and stained with Mayer's Hematoxylin (HIMEDIA) and Eosin yellow (HIMEDIA) in the Sakura Tissue-Tek DRS 200 slide Stainer as per the standard operating protocol.

The slides were then viewed under binocular light microscopy by the pathologists. The report was provided using the terminology of the WHO Classification of Female Genital Tumors, 5th edition (Höhn et al., 2021).

Data were retrieved from hard copy of patient's record maintained in the colposcopy clinic of JDWNRH into a data collection form which included all the study variables. The study variables included sociodemographic profiles, results of pap smear, indications of colposcopy, colposcopy diagnosis, and procedures (either punch biopsy or LEEP). The histopathology results were retrieved using patients' citizenship identity card number from the Department of Pathology and Laboratory Medicine, JDWNRH.

Descriptive statistical analysis was performed by using SPSS version 25 (IBM, Armonk, NY, USA). Performance of colposcopy is presented as sensitivity, specificity, and accuracy. P value <0.05 was considered statistically significant. The histopathology result was considered the gold-standard for calculating colposcopic performance. In the histology result, CIN II and III were considered as "CIN 2+", whereas atrophic change, chronic cervicitis, squamous metaplasia, cervical polyp and CIN I were considered as "CIN 2-". Overtreatment with LEEP was calculated with women with either normal or CIN 1 (numerator) divided by total women who had LEEP (Denominator).

Ethical clearance was obtained from the Research Ethics Board of Health, Ministry of Health, Bhutan (vide reference letter number REBH/Approval/2021/119 dated 12/10/2021). The waiver of consent was obtained. The confidentiality of study participants was maintained by removing all personal identifiers.

RESULTS

Sociodemographic details of the study population

In this review of records, a total of 84 women availed the colposcopy services provided at Paro during the reference period. The mean $\pm$ SD age of women was 41 ± 9 years. Seventy-nine women (94.0%) were residing in Paro district. Forty-eight (57.1%) did not have any form of education, 56 (66.7%) were housewives, 45 (53.6%) had a monthly family income less than Ngultrum 10,000. Their mean age at coitarche was 20 ± 4 years, and the mean age at first child birth was 22 ± 4 years. The majority of the women were multiparous (81%) (Table 1).

Indications and results of colposcopy, and procedures performed

ASCUS was the most frequent diagnosis of cervical Papanicolaou (Pap) test, comprising 44 (52.4%) of all diagnoses, followed by LSIL 13 (15.5%) and ASC-H 11 (13.1%). Seventy-five (89.3%) of the women underwent colposcopy due to abnormal result in Pap test. Colposcopy examination revealed low grade lesion (LGL) in 31 (36.9%) women, and high-grade lesion (HGL) in 41

Table 1: Distribution by sociodemographic profiles of women who availed colposcopy camp services at the colposcopy camp at Paro Hospital in 2021 (n=84)

Variables	Frequency (n)	Percentage (%)
Age in years (mean $\pm$ SD)	(41 $\pm$ 9)	
25-35	23	27.4 %
36-45	38	45.2 %
> 45	23	27.3 %
Residence		
Paro	79	94.0 %
Outside Paro (Thimphu)	5	6.0 %
Marital status		
Married	77	91.7 %
Divorced/widow/unmarried	7	8.3 %
Educational status		
No formal education	48	57.1 %
Educated	36	42.9 %
Occupation		
House wife	56	66.7 %
Civil servant	8	9.5 %
Farmer	11	13.1 %
Others	9	10.7%
Monthly income (in ngultrum)		
<11,000	45	53.6%
11,000-20,000	23	27.4%
>20,000	16	19.0%
Parity		
Nulliparous	2	2.4%
Primi	14	16.7%
Multiparous	68	81.0%
Age at coitarche (mean $\pm$ SD)	(20 $\pm$ 4)	
Age at first child birth (mean $\pm$ SD)	(22 $\pm$ 4)	

(48.8%) women. Intervention in the form of colposcopy guided cervical punch biopsy and LEEP was done in 35 (41.7%) and 33 (39.3%) women, respectively (Table 2).

Table 2. Distribution by Pap result, indication for colposcopy, colposcopy diagnosis and intervention among women who availed services during the colposcopy camp at Paro in 2021 (n=84).

Variables	Frequency	Percentage
PAP smear result		
ASCUS	44	52.4%
ASC-H	11	13.1%
LSIL	13	15.5%
HSIL	7	8.3%
Others*	9	10.8%
Colposcopy Indications		
Abnormal pap	75	89.3%
Others**	9	10.7%
Colposcopy diagnosis		
Normal	12	14.3 %
LGL	31	36.9 %
HGL	41	48.8 %
Procedures performed		
No procedure	16	19.0 %
Cervical biopsy	35	41.7 %
LEEP	33	39.3 %

ASCUS, Atypical squamous cells of undetermined significance; ASC-H, Atypical squamous cells-cannot exclude a high-grade intraepithelial lesion; LSIL, low grade squamous intraepithelial lesion; HSIL, high grade squamous intraepithelial lesion; NILM, Negative for intraepithelial lesion or malignancy; LGL, Low grade lesion; HGL, High grade lesion; LEEP, Loop electrosurgical excisional procedures. *Others (2 cases): Bacterial vaginosis (1), Unsatisfactory (1), Repeated inflammation (2), NILM (5). **Others (8 cases): Post coital bleed (1), Repeated inflammation (2), Chronic pelvic pain (1), chronic PV discharge (1), unsatisfactory PAP (1), cervical polyp (2), Cervical growth (1)

Histology results

Out of 84 women involved in this study, 68 (81.0%) women received intervention (either cervical punch biopsy or LEEP).

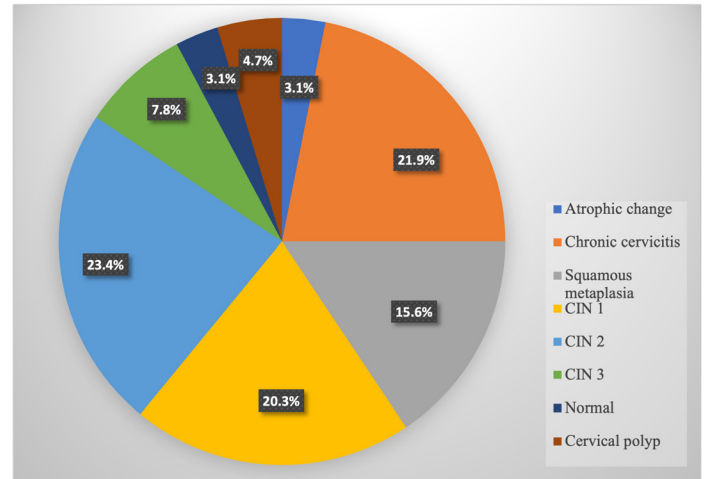


Figure 1. Distribution of histopathological diagnoses of the uterine cervix among women who underwent cervical biopsy/LEEP at the Colposcopy camp in Paro in 2021 (n=68).

The histopathological results of four cases were non-diagnostic due to inadequate/unsatisfactory specimens. The spectrum of histopathological diagnoses in the remaining 68 cases is illustrated (Figure 1)

Diagnostic performance of colposcopy

Evaluation of the performance of colposcopy in diagnosing histologic CIN2- and CIN2+ among 68 cases (Table 3). The sensitivity, specificity, and accuracy of colposcopy to diagnose histologic CIN 2- were 30.8 %, 56.9 %, and 51.6 %; and to diagnose histologic CIN 2+, were 70.0 %, 56.8 %, and 60.9% respectively.

Table 3. Performance of colposcopy to diagnose histologic CIN 2- and CIN 2+ in the camp setting (n=68)

	Sensitivity (%)	Specificity (%)	PPV (%)	NPV (%)	Accuracy (%)
Histologic CIN2-	30.77	56.86	15.38	76.32	51.56
Histologic CIN2+	70.00	56.82	42.42	80.65	60.94

CIN 2+ included CIN II and III; CIN 2 included atrophic change, chronic cervicitis, squamous metaplasia, cervical polyp and CIN1; CI, confidence interval; PPV, positive predictive value; NPV, negative predictive value

Table 4. Distribution of histopathological diagnosis of women who underwent cervical punch biopsy and LEEP (n=68).

		Cervical punch biopsy	LEEP	Total
Histopathology diagnosis	Non-neoplastic	15	16	31
	CIN I	6	7	13
	CIN II/III	10	10	20
	Unsatisfactory	4	0	4
Total		35	33	68

DISCUSSION

In this study involving the review of records of colposcopy performed in the camp setting among 84 women, the sensitivity, specificity and accuracy of the colposcopy to diagnose histologic CIN 2+ were 70.0%, 56.8%, and 60.9% which is lower than the colposcopic performance of senior colposcopists at the colposcopy clinic of JDWNRH (Dorji et al., 2022). The colposcopist involved in the Paro colposcopy camp was one of three senior colposcopists who participated in the aforementioned study (Dorji et al., 2022). The difference in the colposcopy performance is probably attributable to the difference is the colposcopy machines used (proMIS COLpro

222DX-OZview in the current study versus EDAN C3A in the aforementioned study). The World Health Organization (WHO) recommends using freshly prepared 3-5% acetic acid to be used for colposcopy, and disposing of any remaining dilutions at the end of the day (WHO Technical Guidance and Specifications of Medical Devices for Screening and Treatment of Precancerous Lesions in the Prevention of Cervical Cancer, 2020). However, 3-5% acetic acid was prepared one day in advance of starting the colposcopy camp and the same batch was used for one week. This probably might have contributed to the lower performance of colposcopy. In an attempt to improve the quality of colposcopy, the recently endorsed standard guideline on colposcopy in Bhutan recommends use of 5% acetic acid, which has to be prepared freshly on the day of colposcopy (Practical Guideline on Colposcopy & Treatment of Cervical Pre-Cancer in Bhutan, 2024)

The single-visit approach of either “screen and treat” or “see and treat” reduces loss of follow-up, had a similar overtreatment rate as compared to conventional multiple-visit management, and it had demonstrated benefits in low-resource countries (Sankaranarayanan et al., 2007; Vet et al., 2012). In this study, the “screen, triage and treat” with LEEP has effectively treated 30.3% (10 out of 33) of cases with HSIL. The overtreatment rate in this study was approximately 70% which is

Location of Colposcopy Centres of Bhutan, 2022

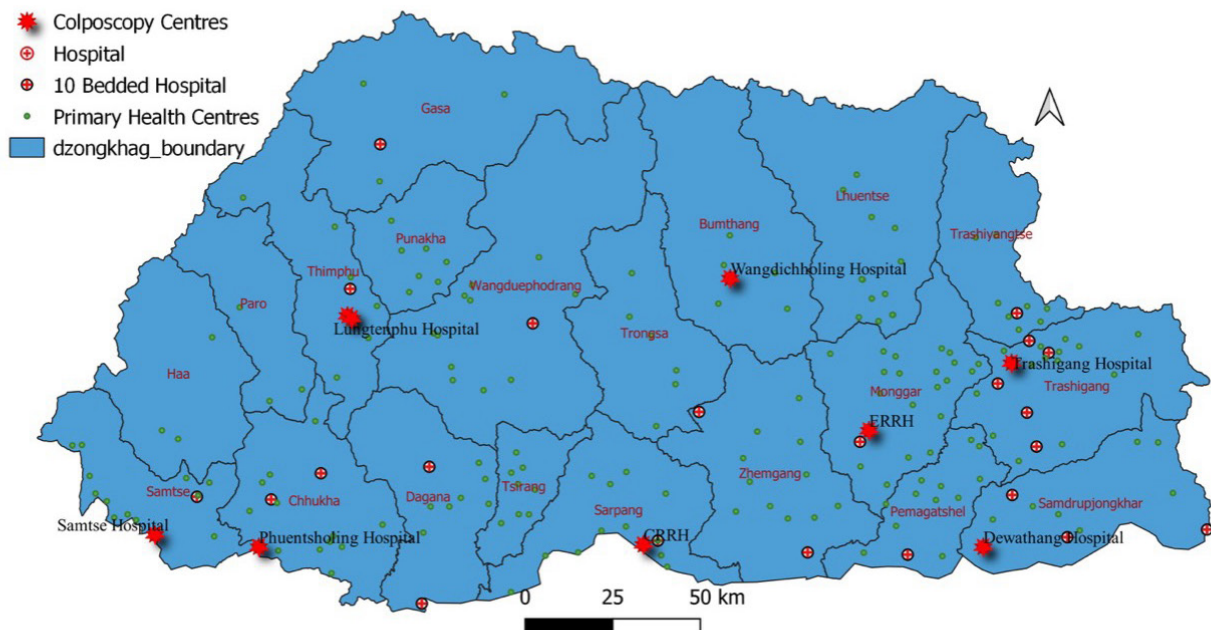


Figure 2. Map of Bhutan showing the colposcopy centres (in pink asterisk) as of 2022

higher than those reported from other low-income countries (Sankaranarayanan et al., 2007; Vet et al., 2012). This could be due to misdiagnosis of cervicitis as HGL on colposcopy which is evidenced by 48.4% with normal histology result among 33 women who had LEEP treatment. Considering the low complication rate of LEEP and high likelihood of loss to follow up among village folks, over treatment of cervicitis with LEEP seems acceptable in Bhutan's context.

Among women who underwent cervical biopsy, 28.6 % (10 out of 35) had HSIL who will need treatment with either LEEP or cryotherapy. As majority of study participants is illiterate (57.1%), loss of follow up is highly likely. The 2019 ASCCP consensus guideline recommends immediate treatment using an excisional procedure without previous biopsy as a preferred option in non-pregnant women 25 years or older with an estimated immediate risk of CIN 3+ of 60% or greater (Perkins et al., 2020).

Service providers faced challenges while conducting such camps. At the technical level, biopsy forceps were too large for smaller lesions, thus preventing the correct biopsy of the lesion. In addition, the LEEP procedure, which is done under total intravenous anesthesia (TIVA) as per the national protocol requires observation of patients after the operation. This leads to putting stress on the limited colposcopy centers (Figure 2), such as the beds. Such challenges affect the service delivery, e.g. only a limited number of LEEP procedures can be performed in a single day. A randomized trial has shown that the LEEP performed under local anesthesia is equally tolerated and offers procedure-related and patient-reported benefits over general anesthesia (Rezniczek et al., 2020).

With the introduction of HPV DNA testing with reflex cytology including self-sampling as national cervical cancer screening program, the health seeking behavior towards cervical cancer screening might improve. Our screening guideline is in line with the WHO recommendation of screen, triage and treat including self-sampling for HPV DNA test (WHO Guideline for Screening and Treatment of Cervical Pre-Cancer Lesions for Cervical Cancer Prevention, Second Edition. Geneva: World Health Organization, 2021).

With the insight gained from this retrospective study, colposcopy camp services are beneficial for the rural communities and should be expanded widely. In cases of HGL on colposcopy, LEEP should be continued in the camp setting until we have enough manpower and public literacy to avail multiple visit services. We also recommend studies to cover cost-benefit analysis, public perception, patients' satisfaction level, and issues and challenges. Such studies could be useful for promoting and enhancing colposcopy services, as well as investments in manpower and equipment, among others. In order to curb the menace of cervical cancer and achieve the global elimination target 2030 ("Global Strategy to Accelerate the Elimination of

Cervical Cancer as a Public Health Problem," 2020), colposcopy camps should be continued in Bhutan.

Strength

This is the first study in Bhutan that provides a baseline data on colposcopy camp services in Bhutan, and way forward. There is no interobserver variation in this study as the colposcopy and histopathology examination performed by a gynecologist and a pathologist respectively.

Limitation

This study being a retrospective review involving a small sample size is the major limitation. The findings of this study can't be generalizable to the rest of colposcopy camps conducted across Bhutan, as different colposcopists with varying years of experience perform colposcopy. Other limitation was that the margin status of LEEP specimen were not studied, and we have no data on outcome of management of those women who had cervical biopsy and has HSIL on histopathology. This is because, review of records for the purpose this study was done within six months of colposcopy. In Bhutan, follow up HPV DNA is usually recommended in 12 months as per the Practical Guideline on Colposcopy & Treatment of Cervical Pre-Cancer in Bhutan (Practical Guideline on Colposcopy & Treatment of Cervical Pre-Cancer in Bhutan, 2024).

Acknowledgement

We are thankful to Kinley Dorji, Research Officer, Ministry of Health, Thimphu, Bhutan for generating the Bhutan map showing colposcopy centers.

Declaration of interest

There is no conflict of interest involved for this study

Financial disclosure

There is no budget involved in this study.

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Education Policy Reform in South Asia: A Comparative Analysis of India's National Education Policy 2020 and Bhutan's National Education Policy 2024

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ABSTRACT

National education policies play a critical role in shaping equitable, future-ready, and culturally grounded education systems in an increasingly dynamic global context. This study employs a comparative qualitative deductive content analysis to examine India's National Education Policy (NEP) 2020 and Bhutan's National Education Policy (NEP) 2024, focusing on their philosophical foundations, educational structures, curriculum reforms, and assessment strategies. Bhutan's policy, guided by the Gross National Happiness (GNH) framework, emphasises holistic development, sustainability, cultural identity, and values-based education, with a strong focus on localised implementation and learner well-being. In contrast, India's policy, rooted in constitutional values and Indian ethos, seeks to transform the education system to enhance global competitiveness, promote multilingualism, and achieve a hundred per cent Gross Enrolment Ratio by 2030 through a restructured 5+3+3+4 educational framework. Both policies prioritise inclusivity, equity, and competency-based learning. Curriculum reforms in both countries highlight experiential learning, digital literacy, and interdisciplinary approaches. However, Bhutan places comparatively greater emphasis on socio-emotional development and environmental sustainability, while India focuses more extensively on systemic transformation, research, and institutional reform. Assessment reforms in both contexts reflect a shift toward competency-based evaluation. Bhutan conducts national board examinations at Grades X and XII, administered by the Bhutan Council for School Examinations and Assessment, as well as diagnostic national assessments at other levels. India, on the other hand, introduces comprehensive assessment reforms through frameworks such as PARAKH to standardise evaluation practices and promote holistic learner assessment. The study contributes to comparative education policy discourse by identifying key convergences and contextual differences between the two systems. It highlights opportunities for cross-national learning and suggests that future research should examine policy implementation, educational outcomes, and avenues for regional collaboration in strengthening education systems.

Keywords: *India's National Education Policy 2020, Bhutan's National Education Policy 2024, Comparative Policy Analysis, Qualitative Content Analysis*

INTRODUCTION

Education policies serve as foundational frameworks that shape the structure, direction, and outcomes of national education systems. They influence key dimensions such as access, equity, curriculum design, governance, and assessment practices, thereby determining how effectively education contributes to social, economic, and cultural development. Well-formulated education policies not only respond to national priorities but also align with global educational goals, ensuring that learners are equipped with the knowledge, skills, and values required for the twenty-first century. In this context, the design and implementation of education policies play a critical role in fostering inclusive, relevant, and sustainable education systems.

Within this broader context, both Bhutan and India recognise education as a central driver of national development and societal transformation. In Bhutan, the importance of a strong education system has been consistently emphasised in national discourse. His Majesty Jigme Khesar Namgyel Wangchuck (Fifth King), in his address at the third convocation of the Royal

University of Bhutan on February 17, 2009, stated:

We can dream of a nation of environmental conservation, Gross National Happiness (GNH), a strong economy, a vibrant democracy and yet none are possible or sustainable if we have not already toiled and sweated in the building of a strong education system.

Furthermore, in a Royal Kasho dated December 17, 2020, His Majesty the Fifth King emphasised the urgency of educational transformation:

We have a sacred duty to fundamentally reshape our educational system, including its curriculum, infrastructure, classrooms, and assessment methods. As we progress into the twenty-first century, our learners need to become critical and creative thinkers, curious problem-solvers, and skilled collaborators who are comfortable with technology. Education should inspire self-discovery and exploration, empowering children to become knowledge creators rather than just passive recipients.

The Chairperson of the National Education Policy 2020, Dr. K. Kasturirangan, remarked that The vision of India's new educational system has been crafted to ensure that it touches the lives of every citizen, consistent with their needs and necessities, besides creating a just and equitable society.

The growth of any society fundamentally depends on the strength of its education system, which is a crucial means of breaking the cycle of poverty, disadvantage, and disempowerment (Wangdi & Boossabong, 2024). Education has been essential to shaping the country's social, economic, political, cultural, intellectual, and environmental development, helping to define its character as a peaceful, forward-looking, and contented nation (Ministry of Education and Skills Development, 2014). Ensuring universal access to quality education is essential for India's sustained development and for its emergence as a global leader in economic progress, social justice, equality, scientific innovation, national integration, and cultural preservation (Ministry of Education, 2020). In response to their respective societal and national needs, both India and Bhutan have introduced new National Education Policies to strengthen and reform their educational systems.

India is a large, geographically diverse country with extensive plains, deserts, and the Himalayan Mountain range. Bhutan, a small, landlocked kingdom in the Himalayas, is almost entirely mountainous. India's socio-economic landscape features rapid economic growth alongside persistent poverty and inequality in the education sector (Schmidt, 2017; Jan & Faiz, 2025). Its economy is driven by agriculture, industry, and services, yet significant disparities in wealth and access to resources persist. By contrast, Bhutan emphasises Gross National Happiness (GNH) over purely economic indicators, prioritising sustainable development, environmental conservation, and cultural preservation (Brooks, 2013; Thinley & Hartz-Karp, 2019). Its economy relies on hydropower, agriculture, and tourism.

Comparing the education systems of India and Bhutan provides valuable insights into how geographical, socio-economic, and cultural factors shape educational development and outcomes. India's education system, while vast and diverse, grapples with issues of access, quality, and equity (Verma & Dorzi, 2014). Bhutan, despite its limited resources, has made strides in expanding access to education, focusing on holistic development and aligning education with its GNH philosophy (Malik, 2019). A comparative analysis can reveal lessons for fostering inclusive, relevant, and sustainable educational practices tailored to specific regional needs and developmental goals. Therefore, the main aim of the study is to employ comparative content analysis to investigate the national education policies, Bhutan's National Education Policy (NEP) 2024 and India's National Education Policy (NEP) 2020, focusing on their philosophical foundations, educational structures, curriculum reforms, and assessment strategies.

REVIEW OF THE LITERATURE

Education policy can be understood as a framework of guiding principles and strategic decisions that shape the organisation, governance, and delivery of education systems. It influences how educational opportunities are structured, resourced, and evaluated across different contexts. Scholars emphasise that effective education policies are central to promoting equitable access, enhancing quality, encouraging innovation, and aligning education with broader socio-economic and cultural goals (Viennet & Pont, 2017). Well-developed policy frameworks typically incorporate coherent philosophical orientations, clearly defined system structures, relevant and flexible curricula, and comprehensive assessment mechanisms that support meaningful learning outcomes.

Research on policy implementation further suggests that the effectiveness of education policies depends not only on their design but also on the processes through which they are enacted, including stakeholder engagement, institutional capacity, and alignment between policy goals and practice (Viennet & Pont, 2017; Organisation for Economic Cooperation and Development (OECD), 2017). Comparative studies of high-performing education systems indicate that countries such as Finland and Singapore have achieved strong educational outcomes by maintaining coherent, well-aligned policy frameworks that balance quality, equity, and adaptability to changing societal demands (OECD, 2012; OECD, 2019).

Within education policy research, several key dimensions are widely recognised as central to the analysis of policy design and effectiveness. First, philosophical foundations reflect the values, ideologies, and national priorities that guide an education system. According to Ball (1994), education policies are not neutral but are shaped by political, cultural, and ideological contexts. Similarly, Rizvi and Lingard (2010) argue that education policies are increasingly influenced by globalisation while still reflecting local socio-cultural priorities. These philosophical orientations determine how systems balance equity, identity, and global competitiveness.

Second, educational structures refer to the organisation and governance of education systems, including stages of schooling, institutional arrangements, and access pathways. Research by the OECD (2015) highlights that coherent structural design contributes to system efficiency, participation, and progression across educational levels. Similarly, the United Nations Educational, Scientific and Cultural Organisation (UNESCO, 2017) emphasises that well-structured systems are essential for achieving equitable access and lifelong learning opportunities.

Third, curriculum is a central component of education policy, defining the knowledge, skills, and competencies that learners are expected to acquire. Contemporary researchers highlight a global curriculum shift towards competency-based, learner-centred, and interdisciplinary approaches. Voogt and Roblin (2012) noted that 21st-century curricula increasingly emphasise critical thinking, digital literacy, and problem-solving

skills. Similarly, the OECD (2018) Education 2030 framework underscores the importance of preparing learners for complex and rapidly changing global environments.

Fourth, assessment strategies play a crucial role in shaping teaching and learning practices. Formative and competency-based assessment approaches are increasingly complementing traditional high-stakes examinations. Research by Black and Wiliam (1998) demonstrates that formative assessment significantly improves learning outcomes. In addition, the OECD (2013) emphasises that balanced assessment systems are essential for improving both quality and equity in education. These dimensions, philosophical foundations, educational structures, curriculum reforms, and assessment strategies provide a coherent analytical framework for examining education policies and are widely supported in the literature.

Within this broader conceptual context, both India's and Bhutan's current national education policies place a strong emphasis on holistic development, inclusivity, and equitable learning opportunities. A review of existing comparative studies, however, reveals notable gaps in the literature. For instance, Sarkar and Sarkar (2018) examined environmental education in both countries, focusing on curriculum objectives, content, pedagogy, and evaluation. While their study demonstrated a shared commitment to environmental education, it also identified structural weaknesses in implementation and evaluation processes. Htun (2023) conducted a comparative analysis of Human Development Index (HDI) trends between 2012 and 2021, finding that although India initially reported higher HDI values, Bhutan surpassed India after 2016, with both countries remaining in the medium human development category. Dorji (2014) compared secondary teacher education curricula at the Royal University of Bhutan and the University of Pune, India, and found limited responsiveness to contemporary educational demands, with some strengths in the Indian context regarding teacher roles and technology use. Additionally, Malik (2019) analysed the National Education Policies of India and Bhutan using Walt and Gilson's (1994) health policy triangle and Bacchi's (2009) problem-representation framework, offering insights into stakeholder power dynamics and policy silences.

While these comparative studies have contributed valuable insights into health policy, teacher education, environmental sustainability, and development indicators, there is an apparent lack of research focused on the recent national education policies of the Indian NEP (2020) and Bhutan NEP (2024). This study addresses that gap by conducting a comparative policy analysis of these two landmark documents. The analysis is guided by four key dimensions: philosophical foundations, educational structures, curriculum reforms, and assessment strategies, which are derived from and aligned with established education policy and policy analysis literature that emphasises the importance of policy vision, system design, pedagogical content, and evaluation mechanisms in understanding policy effectiveness (Viennet & Pont, 2017; OECD, 2017; Ball, 1994). Collectively, this study points to the need for further research on how national

education policies can more effectively address contemporary educational challenges and context-specific needs in both India and Bhutan.

METHODOLOGY

This study employed a qualitative content analysis approach to examine India's National Education Policy (NEP 2020) and Bhutan's National Education Policy (NEP 2024), with official policy documents serving as the primary data sources. Qualitative content analysis is a systematic method for interpreting textual data by identifying themes and patterns (Elo & Kyngäs, 2008). This approach is particularly suitable for policy analysis, as it enables the structured examination of policy documents and their underlying meanings. Given that the study aims to compare two national education policies, this method enables both descriptive and interpretive analysis of policy content while ensuring consistency and comparability. Furthermore, the qualitative approach allows for the capture of context-specific nuances.

A deductive content analysis approach was adopted, in which categories were informed by existing theoretical and policy literature (Fife & Gossner, 2024). This approach allows for a theory-driven analysis while maintaining consistency and comparability across cases. The analysis was guided by four thematic categories: philosophical foundations, educational structures, curriculum reforms, and assessment strategies. These themes were derived from a preliminary reading of the documents and were informed by relevant literature on policy analysis. The coding and theme development were carried out manually by the two authors through iterative reading, discussion, and consensus-building to ensure consistency and analytical rigour. Two independent coders analysed the data, and inter-coder reliability was assessed using percentage agreement, yielding eighty-eight per cent, which meets recommended standards (Stemler, 2001). In addition, intra-coder reliability checks were conducted to ensure consistency in coding over time. To guide the analysis, the study is structured around the following research questions (RQ):

1. What are the philosophical foundations guiding the national education policies of India's National Education Policy (2020) and Bhutan's National Education Policy (2024), and how do they reflect each country's cultural and developmental priorities?
2. What is the distribution of references to different levels of education in the National Education Policy (2020) of India and the National Education Policy (2024) of Bhutan?
3. How are curriculum reforms conceptualised and proposed for implementation in NEP (2020) and NEP (2024)?
4. In what ways do NEP (2024) and NEP (2020) differ or converge in their approaches to student assessment?

RESULTS

RQ 1. What are the philosophical foundations guiding the national education policies of India's NEP (2020) and Bhutan's NEP (2024), and how do they reflect each country's cultural and

developmental priorities?

I. Bhutan's National Education Policy (2024)

a) Philosophical Foundations

The philosophical foundations that guide Bhutan's National Education Policy (2024) are deeply rooted in the principles of Gross National Happiness (GNH), Buddhist values, and the nation's unique cultural identity. These foundations emphasise holistic development, moral and ethical growth, sustainability, and cultural preservation. The policy explicitly states that "GNH shall be the guiding framework for education," aiming to foster comprehensive learner development, sustainability, equity, and ethical citizenship (Ministry of Education and Skills Development, 2024, p. 4).

His Majesty's decree highlights a significant shift from rote learning to pedagogical approaches that encourage critical thinking, creative thinking, lifelong learning, problem-solving, and collaboration (MoESD, 2024, p. 1). The policy vision seeks to harmonise academic excellence with holistic well-being, cultural identity, and sustainable citizenship (MoESD, 2024, p. 3). Furthermore, it promotes core values that encompass social, emotional, ethical, cultural, and personal growth (MoESD, 2024, p. 3). It also ensures "access to quality, inclusive education" that meets diverse learning needs, including those of individuals with disabilities (MoESD, 2024, p. 3).

b) Reflection of Cultural & Developmental Priorities

Upholds cultural preservation through *thad dam tshig las 'gyur 'bras* (sacred commitment and karmic responsibility). Focuses on sustainable development and climate resilience, embedding environmental stewardship into all education levels. Prepares learners for a globalised, technology-driven world while reinforcing Bhutanese unity and identity.

II. India's National Education Policy (2020)

a) Philosophical Foundations

The NEP (2020) is "rooted in Indian ethos" and aims to develop an education system that sustains India as "a global knowledge superpower" while preserving ancient traditions (Ministry of Education, 2020, p. 6). It draws on "ancient and eternal Indian knowledge and thought" and highlights institutions such as Nalanda and Takshashila as role models of multidisciplinary learning (MoE, 2020, p. 4). The goal is for India to develop an education system by 2040 that is second to none, ensuring equitable access to top-quality education for all learners, regardless of their social or economic background (MoE, 2020, p. 3). This National Education Policy (2020) represents the inaugural educational policy of the twenty-first century, intending to address the numerous developmental imperatives of our nation. (MoE, p. 3). The policy emphasises "full equity and inclusion" in educational decision-making to ensure all students thrive, especially marginalised groups (MoE, p. 5). India's NEP (2020) aligns with SDG 4, which aims to "ensure inclusive and equitable quality education," and promotes lifelong learning by

2030 (MoE, p. 3).

b) Reflection of Cultural & Developmental Priorities

- Preserves Indian cultural heritage (languages, arts, traditions) while integrating modern disciplines such as AI, machine learning, and environmental education.
- Addresses demographic dividend by preparing the largest youth population for a dynamic global economy.
- Strengthens national unity through respect for diversity and constitutional values Positions India as a research and innovation hub through emphasis on multidisciplinary and critical thinking approaches.

RQ 2. What is the distribution of references to different levels of education (e.g., early childhood, primary, secondary, and higher education) in India's NEP (2020) and Bhutan's NEP (2024)?

In this section, we examine the distribution of references to different levels of education (e.g., early childhood, primary, secondary, and higher education) in the national education policies of NEP (2020) and NEP (2024). We analysed both policies appropriately to establish the table and theme (see Tables 2 and 3).

I. Bhutan's National Education Policy (2024)

a) Early Childhood Care and Development (ECCD)

The policy defines early childhood as ages 0 - 8 years, with a strong emphasis on holistic development. It highlights ECCD as foundational for lifelong learning and integral to Bhutan's vision of Gross National Happiness (MoESD, 2024, p. 7). ECCD services should be universal, accessible, and inclusive, ensuring that all children, including those with special needs, receive age-appropriate care and education. Parental engagement is a central principle, with the policy requiring ECCD programmes to "support parents and caregivers with knowledge and skills to nurture children's development" (MoESD, 2024, p. 8). Infrastructure standards are also specified, including safe learning spaces, hygiene, and access to outdoor play areas. The teacher preparation framework calls for specialised ECCD training, with a clear pathway for professional development. The government commits to integrating ECCD services with the health, nutrition, and protection sectors to provide comprehensive support (MoESD, 2024, p. 9).

b) Primary Education

Primary education begins at age 6, aligning with the ECCD continuum (p. 9). The NEP (2024) mandates free education for all Bhutanese children up to Grade XII to maintain proximity between home and school, especially in rural areas, and to avoid boarding at an early age. The curriculum will integrate literacy, numeracy, life skills, and cultural values, while also fostering creativity and problem-solving skills. A cluster school model is proposed to improve resource allocation and teaching quality across primary levels (MoESD, 2024, p. 10). Inclusivity is reaffirmed, ensuring that primary schools adapt to diverse learning needs and remove barriers to participation.

Table 1: Cross-Country Thematic Coding – Philosophical Foundations and Priorities

Theme (Code)	India NEP 2020	Bhutan NEP 2024
Cultural Heritage as Foundation	“Rooted in Indian ethos, ancient and eternal Indian knowledge and thought” (p. 4, p. 6)	“Empowering 21st century learning rooted in Bhutanese values of <i>tha dam-tsig ley gju-drey</i> ” (p. 3)
Holistic Human Development	“Develop cognitive, social, ethical, and emotional capacities” (p. 4)	“Harmonising academic excellence with holistic well-being” (p. 3)
Equity and Inclusion	“Full equity and inclusion as the cornerstone” (p. 5)	“Ensure all have access to quality, inclusive education” (p. 3)
Sustainability Orientation	“Responsible commitment to sustainable development and global well-being” (p. 6)	“Educate on climate change, sustainability, and green economy” (p. 3)
Global Alignment	“Aligned with SDG4 lifelong learning for all by 2030” (p. 3)	“Guided by SDGs sustainable citizenship” (p. 4)
Pedagogical Approach	“Multidisciplinary inquiry-based... experiential” (p. 5)	“Self-discovery and exploration, creation of knowledge” (p. 1)
Developmental Priority	“Transform India into a global knowledge superpower” (p. 6)	“Resilient, disaster-proof education system, sustainable resource use” (p. 5)

Table 2: Distribution of References to Various Education Levels

Theme	Page Numbers	Approx. Share of Education-Level References
Early Childhood Care & Development (ECCD)	pp. 7–9: Detailed definition of early childhood (0–8 years), ECCD standards, parental involvement, inclusion, teacher training, infrastructure.	~18%
Primary Education	pp. 9–10: Pre-primary entry age (6 years), curriculum, free education provision, cluster school model from ECCD to Grade XII, keeping young children close to home.	~14%
Secondary Education	pp. 9–11: Structure from Grade VII–XII, specialised secondary schools, STEM/arts/sports integration, infrastructure and safety standards, boarding/central schools.	~16%
Higher Education	pp. 19–20: Access based on merit, alignment with Bhutan Qualifications Framework, institutional autonomy, quality assurance.	~10%
TVET (Technical & Vocational Education)	pp. 16–18: Industry linkages, curriculum adaptation, incubation centres, entrepreneurship.	~8%
Lifelong Learning / Literacy	pp. 21–22: Adult education, skills for green economy, community-based learning.	~6%

c) Secondary Education

Secondary education (Grades VII–XII) is designed to provide broad academic preparation, along with opportunities for specialisation in the arts, sciences, and vocational tracks. The policy promotes specialised secondary schools in areas such as STEM, the arts, and sports (MoESD, 2024, p. 11). Infrastructure standards, including disaster resilience, safe boarding facilities, and inclusive access, are mandated for secondary schools. The

curriculum aims to balance academic content with 21st-century skills, including collaboration, critical thinking, and digital literacy.

d) Technical and Vocational Education and Training (TVET)

TVET is prioritised as a pathway for both secondary and post-secondary learners. The policy promotes industry-linked programmes, curriculum adaptation to labour market needs,

and the establishment of incubation centres for entrepreneurship (MoESD, 2024, p. 16). TVET institutions are expected to partner with local and international industries for skill development, apprenticeships, and job placements (MoESD, 2024, p. 17). The vision is to transform the perception of TVET from a fallback option to a first-choice career path.

e) Lifelong Learning and Adult Education

The NEP (2024) commits to expanding lifelong learning opportunities through community-based programmes, digital platforms, and skills training for adults (MoESD, 2024, p. 21). Literacy programmes for out-of-school youth and adults are targeted to ensure no Bhutanese are left behind in acquiring basic competencies (pp. 21-22). Skills for the green economy, climate adaptation, and entrepreneurship are embedded into lifelong learning curricula (MoESD, 2024, p. 22).

II. India's National Education Policy (2020)

a) Early Childhood Care & Education (ECCE / Foundational Stage)

Early Childhood Care and Education (ECCE) (ages 0-8) is treated as foundational and a national priority; the NEP (2020) identifies the early years as critical for brain development and learning readiness. NEP (2020) proposes a National Curricular & Pedagogical Framework for ECCE (NCPFECCE) with sub-frameworks for 0-3 and 3-8-year-olds. The framework will incorporate local traditions (stories, songs, plays). Universal access target: phased universal provisioning of high-quality ECCE goal by 2030 for school readiness.

b) Primary Education (Foundational & Preparatory stages; Grades 1-5)

Main emphases: Foundational literacy & numeracy (FLN) by Grade 3 is the highest priority and a national mission (explicit targets and timelines). National Mission on Foundational Literacy and Numeracy (NIPUN) to achieve universal FLN by Grade 3; states must prepare implementation plans with stage-wise targets. PTR targets (under 30:1 typical; under 25:1 for disadvantaged areas) and hiring to fill teacher vacancies to support FLN. Emphasis on mother-tongue / home language instruction at least until Grade 5 (preferably Grade 8) and bilingual materials for science/maths. NEP (2020) treats primary education as the stage at which foundational skills must be firmly established; the policy links teacher quality, language policy, reduced curricula, and expanded ECCE to this goal.

c) Secondary Education (Middle & Secondary stages; Grades 6-12)

Main emphases: Structural reconfiguration to 5+3+3+4 (Middle: 6-8; Secondary: 9-12) with multidisciplinary, flexibility, and student choice in secondary school. Secondary stage to offer greater depth, critical thinking, elective choices, and options to exit/enter at Grade 10 or continue to Grade 11-12. No rigid separation between curricular and vocational streams; vocational education integrated from Grade 6 onwards. Semester or modular systems suggested to allow exposure to more subjects; emphasis on experiential, arts- and sports-integrated pedagogy. Move from summative, exam-centric culture to a formative “assessment for learning” and multiple exit/entry pathways. Secondary education

Table 3: Distribution of References to Various Education Levels

Theme	Page Numbers	Approx. Share of Education-Level References
Early Childhood Care & Education (ECCE)	pp. 7–8, 12–14: Foundational stage (ages 3–8); integration of Anganwadi and preschools; play-based pedagogy; NCERT Early Childhood Curriculum.	~15%
Primary Education	pp. 8–9, 15–17: Foundational & preparatory stages (Grades 1–5), focus on literacy & numeracy (NIPUN Bharat), multilingual education, continuous assessment.	~18%
Secondary Education	pp. 9–10, 18–22: Middle & secondary stages (Grades 6–12), vocational exposure, multidisciplinary curriculum, life skills, flexible subject choices.	~20%
Higher Education	pp. 33–52: Large coverage on multidisciplinary universities, credit transfer, National Higher Education Qualifications Framework, GER targets, and institutional governance.	~25%
Vocational Education	pp. 22–25: Integrated from Grade 6 onward, hands-on training, internships, industry partnerships.	~8%
Adult Education / Lifelong Learning	pp. 26–28: Flexible learning opportunities, literacy missions, technology-enabled learning.	~5%

is presented as the pivot to specialisation and career orientation while preserving breadth. NEP's reforms aim to reduce early streaming and open vocational/academic mobility.

d) Higher Education

Major, detailed overhaul of higher education (most extensive single policy section), emphasis on multidisciplinary, autonomy, quality, research, and governance. Reorganise HEIs into prominent, multidisciplinary universities/colleges; create a Higher Education Commission of India (single regulator with multiple verticals) and a National Higher Education Qualifications Framework. Institutional restructuring, consolidation, and alternative governance for federated/affiliating models; greater institutional autonomy for teaching, staffing, and finance. Emphasis on research: National Research Foundation (NRF) to fund and catalyse research across disciplines. Credit system, multiple entry/exits with certificates/diplomas/degrees, multidisciplinary undergraduate degrees (flexible four-year bachelor's with exit options). Equity & inclusion measures, teacher/faculty career pathways, incentives for research and teaching excellence. NEP (2020) contains elaborate institutional and regulatory redesigns intended to transform India into a knowledge society. This is the policy's most detailed and prescriptive section.

e) Vocational Education / TVET

Vocational education is mainstreamed and made a first-choice option rather than a fallback; integration begins at Grade 6 and continues through secondary and higher stages. Reimagining vocational education: modular courses, internships, industry partnerships, and credit recognition within the formal system. Strengthening institutions (polytechnics, ITIs) and aligning TVET with industry needs and quality assurance. NEP (2020) positions TVET as cross-cutting: embedded early in schooling, linked to higher education via credits and apprenticeships, and central to employability goals.

f) Adult Education & Lifelong Learning

Lifelong learning and adult literacy are recognised as essential; the NEP (2020) advocates expanding Open & Distance Learning (ODL), strengthening NIOS, and expanding adult literacy programmes. Expand NIOS and State Open Schools with levels equivalent to Grades 3, 5, 8, 10, 12, along with vocational courses and life-enrichment programmes. Promote digital libraries, DIKSHA, and technology-mediated lifelong learning platforms. NEP (2020) integrates lifelong learning into the national system, with clear plans for ODL expansion and adult services, but operational details are less specific than those for higher education.

RQ 3. How are curriculum reforms conceptualised and proposed for implementation in NEP (2020) and NEP (2024)?

In this section, we explore the concepts and implementation strategies of curriculum reform as proposed by India's National Education Policy (NEP) 2020 and Bhutan's National Education

Policy (NEP) 2024. We will provide a comprehensive analysis of the key components of their respective curricula, illustrating the significant reforms highlighted in both national education policies. A detailed comparison is presented in Table 4, which outlines the primary curriculum elements referenced by both countries and highlights their approaches to educational enhancement and innovation.

India's National Education Policy (2020): curriculum reform conception and implementation

National Education Policy reframes the aim of education as moving "towards real understanding" and "learning how to learn," reducing rote learning and building character and 21st-century skills (e.g., critical thinking, creativity) (p. 12). Content is pared to "core essentials" to create space for inquiry, discovery, and analysis, with interactive classrooms (p. 12). A curricular-pedagogic architecture, Foundational, Preparatory, Middle, Secondary, aligned to child development; it informs curricula and teaching, not infrastructure (pp. 12-13), and enables flexible exits/re-entries at Secondary (p. 12). Mother-tongue/ home-language medium in early years with strong multilingual proficiency to deepen conceptual learning (pp. 13-14). National

FLN Mission "highest priority"; universal FLN by Grade 3 and by 2025; DIKSHA resources; teacher recruitment/CPD; peer tutoring, volunteers (pp. 9-10). NCERT to craft NCF for school education; States align via SCERTs/textbooks (p. 18; also, textbook availability & lightening schoolbag at pp. 17-18) to operationalise the new pedagogy (pp. 17-18). PARAKH and Boards to realign by 2022-23 to NCFSE 2020-21; Grade-band exams instituted (pp. 19-20). DIKSHA to host high-quality resources that support teacher practice and curricular rollout (pp. 9-10). India conceptualises curriculum reform as system-wide pedagogy + assessment realignment, sequenced from FLN → competency-based pedagogy → flexible assessment supported by national institutions (NCERT, PARAKH, NTA) and digital infrastructure, so implementation is heavily scaffolded by standard-setting bodies and frameworks.

Bhutan's National Education Policy (2024): curriculum reform conception and implementation

The curriculum is designed to deliver holistic development grounded in Bhutanese values/GNH and to prepare learners for a rapidly changing world, with an explicit competency-based orientation (pp. 6-7; 13-14). Updated national curriculum framework to embed cross-cutting competencies (digital, financial, media literacy, problem solving, wellbeing) (pp. 13-15). Dzongkha and English as core languages, with additional language opportunities to balance identity and global access (pp. 15-16). The policy reorganises upper schooling into specialised secondary schools (STEM, TVET, arts/humanities) to align with learners' interests and labour-market needs (pp. 11-12). Emphasis on student-centred, active learning (project-, inquiry-, and problem-based), aligned to competencies and contextualised to Bhutan's culture and environment (pp. 13-14). Curriculum accompanied by inclusive education measures (reasonable accommodations, targeted support for remote/rural

Table 4: Curriculum reform conception and implementation

Theme	India's NEP 2020	Bhutan's NEP 2024
Curricular vision	Holistic, 21st-century skills-oriented education; shift from rote learning to “learning how to learn” (p. 12).	Holistic, future-ready education grounded in national values and Gross National Happiness (GNH); competency-based learning (pp. 6–7).
Structure of schooling	5+3+3+4 structure (Foundational–Preparatory–Middle–Secondary) designed for curriculum and pedagogy reform (pp. 12–13).	Consolidated basic education followed by specialised secondary schooling with pathways/streams; updated national curriculum framework (pp. 11–12).
Curriculum content	Reduction to “core essentials” to create space for inquiry, critical thinking, and analysis (p. 12).	Streamlined, competency-based standards with emphasis on cross-cutting skills (pp. 13–14).
Pedagogy	Experiential, inquiry-based learning; integration of arts and sports; competency-based classroom transactions (p. 13).	Student-centred, active learning approaches, including project- and problem-based learning across subjects (pp. 13–14).
Cross-curricular skills & new subjects	Introduction of AI, design thinking, and computational thinking; emphasis on ethics, citizenship, and environmental education (pp. 16–17).	Digital and financial literacy, coding, and media literacy; wellbeing and values embedded across the curriculum (pp. 13–15).
Language policy	Mother-tongue/home-language as medium of instruction in early grades; strong emphasis on multilingualism (pp. 13–14).	Trilingual approach (Dzongkha, English, and additional languages) to promote cultural identity and equitable access (pp. 15–16).
Vocational & life-skills education	Hands-on vocational exposure in Grades 6–8; internships; “bagless days” for experiential learning (pp. 16–17).	Strong school-to-work linkages, entrepreneurship education, and career guidance; alignment with Bhutan Qualifications Framework (BQF) (pp. 15, 27).
Assessment reform	Shift towards formative and competency-based assessment; holistic 360° progress card; PARAKH; flexible board exams and grade-band assessments (pp. 18–20).	Balanced formative–summative assessment system; national standard-setting assessments to monitor competency attainment (pp. 15–16).
Inclusion	Indian Sign Language standardisation; Universal Foundational Literacy and Numeracy (FLN) mission; equity through arts and sports integration (pp. 9–10, 13, 16).	Inclusive curriculum and assessment accommodations; targeted support for remote and rural learners (pp. 16–17).
Implementation levers	National and State Curriculum Frameworks; NCERT/SCERT leadership; PARAKH, NTA, DIKSHA; phased and guideline-driven implementation (pp. 9–10, 18–20).	Phased implementation with clearly defined responsibilities; specialised secondary schools; cluster-based model; teacher upskilling; timelines extending to 2030 (pp. 11–12, 18–19, 27).

learners, disability-responsive teaching–learning materials) to secure equitable outcomes (pp. 16–17). Bhutan conceptualises reform as a competency-based, values-rooted redesign with structural differentiation at secondary (specialised schools) and whole-system alignment (assessment, BQF, teacher upskilling), sequenced through explicit phases and timelines.

RQ 4. In what ways do NEP (2024) and NEP (2020) differ or converge in their approaches to student assessment?

In this section, we examine how both policies articulate their assessment strategies, with a focus on fostering students' holistic development and achieving meaningful learning outcomes.

Bhutan's National Education Policy (2024):

Assessment is explicitly part of curriculum design, with

a move away from “retention and recall” towards competency-based assessment that evaluates understanding and real-world application (7.22). This reframes exams as measures of proficiency in applying knowledge rather than merely remembering facts (p. 15). School-level assessment is designed to identify strengths and weaknesses in a child's overall development, enabling teachers to tailor educational programs to meet curriculum goals (7.23, p. 16). Nationally, assessments are feedback tools to guide curriculum revision, teacher professional development, and resource allocation (7.24, p. 16). The Bhutan Council for School Examinations and Assessment (BCSEA) conducts National Education Assessments and Board Examinations at the end of Grade X and Grade XII, and at other levels as determined by the Ministry (7.25, p. 16). Bhutan introduces a targeted re-sit

opportunity for students who narrowly fail one compulsory subject, contingent on strong performance in the other two compulsory subjects. This equity-minded safety net maintains

standards (7.26, p. 16). BCSEA will continually develop tools and capacity, collaborate with international assessment boards, and Bhutan will regularly participate in international assessments (7.27-7.29, p. 16).

I. India's National Education Policy (2020)

India's National Education Policy (2020) recasts the aim of assessment from summative/rote to regular, formative, competency-based processes, emphasising analysis, critical thinking, and conceptual clarity; assessment is primarily for learning (4.34, p. 18). A redesigned 360-degree progress card captures cognitive, affective, and psychomotor development; includes self- and peer-assessments, project- and inquiry-based evidence; and envisions AI-based tools to help students/parents/teachers track growth and plan careers (4.35, p. 18). Board exams continue but are redesigned to test core competencies rather than coaching; allow subject choice; enable two attempts per year and explore modular exams, two difficulty levels, and objective and descriptive formats (4.36-4.39, pp. 18-19). All students will take school examinations in Grades 3, 5, and 8 to monitor foundational and core outcomes; results are for developmental purposes only and for anonymised public disclosure to drive system improvement (4.40, p. 19). Establish PARAKH to set norms/standards for student assessment across boards, guide NAS/SAS, and support the shift to 21st-century competencies and equivalence across boards (4.41, p. 19). NTA to run common aptitude and subject tests twice yearly, aiming to reduce coaching, improve flexibility, and lessen duplication across universities (4.42, p. 19). NAS (sample-based) and State SAS provide periodic, transparent diagnostics of learning levels across public and private schools (8.10, p. 33).

DISCUSSION

This comparative analysis of India's NEP (2020) and Bhutan's NEP (2024) illustrates how both countries are actively engaged in educational reforms that reflect their unique cultural, socio-economic, and developmental contexts, while also aligning with global objectives such as the United Nations Sustainable Development Goal 4 (SDG 4). Bhutan's NEP (2024) is deeply rooted in the GNH framework, which integrates Buddhist principles, environmental care, and cultural preservation into its educational aims. This approach aligns with emerging global trends that prioritise socio-emotional learning and student well-being, as seen in systems such as Finland, where education emphasises equity, trust, and holistic development (OECD, 2019). India's NEP (2020), while also promoting holistic development, places stronger emphasis on positioning the country as a global knowledge economy. This reflects policy orientations found in countries such as Singapore, where education systems are designed to balance national identity with global competitiveness

and innovation (Rizvi & Lingard, 2010).

In terms of educational frameworks, both policies emphasise comprehensive access to all levels of education. However, Bhutan places greater emphasis on early childhood development and community-based lifelong learning, whereas India focuses heavily on reforms in higher education, research infrastructure, and governance. Curriculum reforms in both nations are shifting away from rote memorisation toward more engaging, inquiry-based, and competency-driven approaches. Bhutan's curriculum closely aligns with national identity and environmental awareness, whereas India's framework incorporates advanced skills, technology integration, and adaptable learning pathways, embodied in the 5+3+3+4 structure. Vocational education is a priority in both policies, with Bhutan striving to position Technical and Vocational Education and Training (TVET) as a preferred pathway through industry partnerships and entrepreneurial initiatives. In contrast, India introduces vocational exposure as early as Grade 6, linking it to higher education through credit frameworks. With respect to assessment strategies, both policies signal a shift away from rote memorisation towards competency-based and formative assessment approaches. This aligns with international evidence demonstrating the effectiveness of formative assessment in improving learning outcomes (Black & Wiliam, 1998). India's introduction of frameworks such as PARAKH and flexible board examinations reflects global practices aimed at reducing exam pressure and enhancing assessment validity. Bhutan's balanced approach, combining national board examinations with diagnostic assessments, is consistent with OECD recommendations for integrated assessment systems that support both accountability and learning (OECD, 2013).

Overall, these insights suggest that while Bhutan's policy embodies a values-centred, sustainability-driven vision, India's strategy adopts a comprehensive approach to systemic transformation through governance, technology, and international competitiveness. Both nations face common challenges in ensuring equitable access in rural and underserved regions, providing adequate teacher training, and aligning implementation capacity with ambitious policy aspirations.

A mutual exchange of insights between these two approaches can enrich both systems and contribute to a more just and inclusive society. Bhutan's NEP (2024) embeds Gross National Happiness (GNH), well-being, and values as central curriculum outcomes (MoESD, 2024, p. 6-7). India could strengthen its own emphasis on socio-emotional learning by adopting Bhutan's holistic, happiness-oriented perspective, ensuring that education produces not only skilled but also ethically grounded citizens. Bhutan's reorganisation of upper secondary education into specialised schools (STEM, humanities, TVET) (MoESD, 2024, p. 11-12) could inform India's large and diverse system by offering clearer career pathways and reducing academic-vocational hierarchies. Bhutan's commitment to participating in international assessments to calibrate national standards (MoESD, 2024, p. 16) is a practice that India could expand to

Table 5: Summary of Assessment Strategies

Theme	Bhutan NEP 2024	India NEP 2020
Overall purpose of the assessment	Shift from recall to competency-based evaluation of understanding and real-world application; assessment is part of curriculum design (pp. 15–16).	Shift from summative/rote to regular, formative, competency-based assessment focused on higher-order skills (p. 18).
Formative, whole-child reporting	School-level assessment to diagnose strengths/weaknesses and personalise learning (p. 16).	Holistic 360° progress card with self/peer assessment; links home–school; potential AI-based tracking (p. 18).
Periodic large-scale checks	National assessments led by BCSEA; participation in international assessments (p. 16).	NAS (sample-based) + State SAS under PARAKH for system “health check-up” (p. 33).
High-stakes exams (school)	Board exams at the end of Grade X and XII; limited re-sit option if one compulsory subject narrowly failed (p. 16).	Board exams retained but made easier, more flexible; best-of-two attempts; options for modular exams, two-level papers, objective and descriptive formats (pp. 18–19).
Mid-cycle benchmarking	Not specified as Grades 3/5/8; focus is on competency and feedback loops (pp. 15–16).	School exams in Grades 3, 5, 8 to track foundational outcomes; developmental use only (p. 19).
Governance / standard-setting	BCSEA sets and improves national assessment; collaborates internationally (p. 16).	National PARAKH to set norms across boards; guide NAS/SAS; shift boards to 21st-century competencies (p. 19).
Higher-education entrance	Not detailed in the cited section.	NTA standard tests (aptitude + subjects) are conducted at least twice a year to reduce coaching (p. 19).
Equity levers	Diagnostic use of assessment; re-sit relief; international benchmarking to raise standards (pp. 15–16).	Low-stakes, multiple attempts; 360° reporting; foundational stage checks; common entrance to reduce burden (pp. 18–19, 33).

ensure continuous alignment of quality with global education trends. India’s NEP (2020) provides a detailed architecture for flexible, low-stakes board exams, 360° progress cards, and multiple attempts (MoE, 2020, p. 18-19). Bhutan could adopt these innovations to reduce exam-related stress further and enhance educational equity. India’s nationwide FLN by Grade 3 mission (MoE, 2020, p. 9-10) could help Bhutan secure learning equity at the foundational level, especially in rural schools.

CONCLUSION

This study demonstrates that while distinct national contexts shape India’s NEP (2020) and Bhutan’s NEP (2024), both reflect a broader global shift toward inclusive, competency-based, and future-oriented education systems. The comparison reveals that Bhutan’s policy is deeply rooted in the values of holistic development, well-being, and sustainability. In contrast, India’s policy emphasises large-scale systemic transformation, global competitiveness, and readiness for the knowledge economy. The findings highlight that there is no single model of an effective education policy; rather, successful systems balance global

educational trends with local cultural, social, and developmental priorities. This reinforces the importance of context-sensitive policy design, where national identity and global relevance are not mutually exclusive but can be strategically integrated.

Key takeaways from the study include:

- The importance of aligning philosophical foundations with policy implementation to ensure coherence and sustainability.
- The need for education systems to move beyond rote learning toward competency-based, learner-centred approaches.
- The growing role of assessment reform in supporting meaningful learning rather than merely measuring performance.

Policy recommendations emerging from this study are as follows:

For Bhutan: Strengthen system-level governance and implementation mechanisms to complement its strong value-based and holistic framework. Expanding innovations in structured assessment and institutional capacity could enhance policy effectiveness at scale.

For India: Greater emphasis on socio-emotional learning, wellbeing, and sustainability could balance its strong focus on competitiveness and systemic reform. Integrating these

dimensions more explicitly may support more holistic learner development.

For both countries: Invest in teacher capacity building, as teachers are central to translating policy into practice. Strengthen monitoring and evaluation systems to ensure alignment between policy intent and implementation outcomes. Encourage regional collaboration and knowledge exchange to share best practices and address common challenges.

Future research should move beyond policy analysis to examine implementation processes, classroom practices, and measurable learning outcomes. Longitudinal and comparative studies across regions could provide deeper insights into how policy reforms translate into educational impact. Additionally, cross-national collaboration between India and Bhutan could serve as a model for regional policy learning in South Asia.

This study underscores that effective education policy is not only about design but also about context, implementation, and continuous adaptation. By bridging global insights with local realities, both India and Bhutan have the potential to build resilient, inclusive, and future-ready education systems.

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Enhancing Non-Communicable Disease Control: Implementation Experiences of the Service with Care and Compassion Initiative Across Four Districts in Bhutan

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ABSTRACT

Noncommunicable diseases (NCDs) are a leading cause of death globally, responsible for 74% of all deaths, with a major impact on low- and middle-income countries. In Bhutan, NCDs accounted for nearly 69% of deaths in 2016, with cardiovascular diseases being the most significant contributor. Despite whole of government and society approach, the incidence of NCDs, such as hypertension and diabetes are on the rising trends, with many cases undiagnosed and poorly managed. To address this, Bhutan implemented the WHO Package of Essential Non-communicable Disease (PEN) interventions, later enhanced and rebranded as the Service with Care and Compassion Initiatives (SCCI) in 2021. The SCCI employs a 7Rs and 3Cs framework to improve NCD care at the primary healthcare level, focusing on holistic and patient-centered approaches. This paper studies the implementation of the SCCI in four Bhutanese districts—Bumthang, Mongar, Sarpang, and Zhemgang—highlighting the approaches utilized for the prevention and control of NCDs through this comprehensive framework of 7Rs and 3Cs.

Keywords: *Non-communicable disease; Hypertension; PEN package; SCCI; Whole of government.*

INTRODUCTION

Noncommunicable diseases (NCDs) kill 41 million people each year, equivalent to 74% of all deaths globally. Each year, 17 million people die from NCD before age 70; 86% of these premature deaths occur in low- and middle-income countries. Of all NCD deaths, 77% are in low and middle income countries (1). The incidence of Non-communicable diseases (NCDs) in Bhutan is increasing and accounted for 69% of deaths in the country in 2016. Cardiovascular diseases (CVDs) is the highest cause of mortality followed by cancer, respiratory diseases and diabetes(2).

Worldwide, approximately 1.28 billion people aged 30-79 have hypertension, primarily in low and middle-income countries(3). In Bhutan, 30% of the population has raised blood

pressure, with 59% unaware of their condition. Additionally, 5.6% of Bhutanese adults have elevated blood sugar levels, and among them, 59% are undiagnosed. The treatment control rate for these conditions is 25.5%, with 6.1% of adults aged 40-69 at high risk of cardiovascular events in the next decade based on WHO/ISH risk prediction charts(4).

The escalating burden of non-communicable diseases presents a major healthcare challenge globally, including in Bhutan (5). The government also developed a Multisectoral National Action Plan for the Prevention and Control of Noncommunicable Diseases (2015–2020), which urged further interventions to address NCD risk factors identified by PEN. Bhutan adopted the WHO Package of Essential Non-communicable Disease (PEN) intervention in 2009 and expanded it nationwide by 2023 (6). Since 2015, an enhanced version known as PEN HEARTs has

been implemented, later renamed in 2021 to Service with Care and Compassion Initiatives (SCCI), aimed at strengthening NCD service delivery at the primary healthcare level across the country (7).

The SCCI employs the 7Rs and 3Cs framework to prevent and control NCDs and engage communities across all 20 districts of Bhutan (7):

1. Robust Team: Enhances teamwork for patient-centered care by clarifying roles.
2. Recall and Reminder: Medical experts follow up with patients regularly and remind them to take medications.
3. Refill System: Saves time and money by enabling patients to refill medications locally.
4. Responsive Referral: Ensures seamless and quick patient transfers, with clear expectations between health workers and patients.
5. Reach-Out Services:
 - Outreach: Provides screening and health education to at-risk individuals for early detection and prevention of NCDs.
 - Monitoring: Supports chronic and bedridden patients, offering palliative and end-of-life care.
6. Reliable Supply: Ensures affordable essential medicines and technologies are consistently available.
7. Real-Time Monitoring, Supportive Supervision, and Peer Coaching: Essential for enhancing healthcare professionals' skills and knowledge, and keeping them updated on new systems (8).

However, in this paper, the focus was on the implementation of SCCI in the four districts of Bumthang, Mongar, Sarpang and Zhemgang upon approaches undertaken in prevention and control of NCDs through the SCCI framework which heavily relies on providing holistic care.

DESCRIPTION ABOUT SETTINGS

Bumthang, with adult population of over 17800, served by one hospital and five primary health care centers with 64 total health staffs with 1347 registered NCD cases, primarily hypertension patients (8, 9). The activity was implemented with distribution of educational materials, organizing health camps, conducting training programs for health workers where they were able to reach out to large number of people highlighting major risk factors such as high fat and salt intake and alcohol consumption. All the above activities were focused on 7Rs and 3Cs.

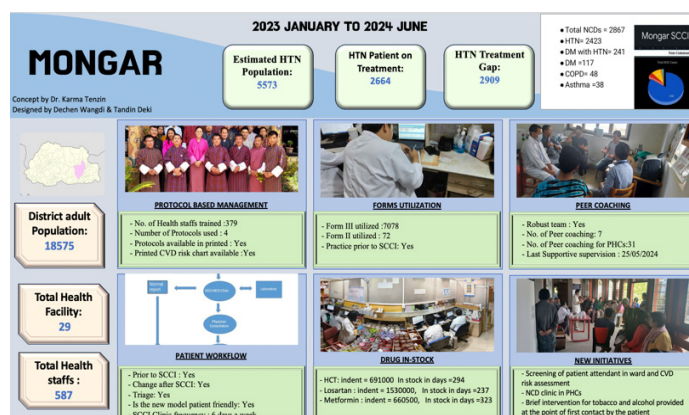


Figure 1. Non-communicable diseases factsheet for Mongar district.

Mongar with 18,575 adult population, 29 health facilities which are manned by 587 total health staffs and caters to around 2900 registered NCD cases (8,10). The main approach adopted by the Mongar team are emphasizing on the strategies to address major risk factors, unhealthy diets and physical inactivity. After a dedicated and robust team was formed in response to SCCI;

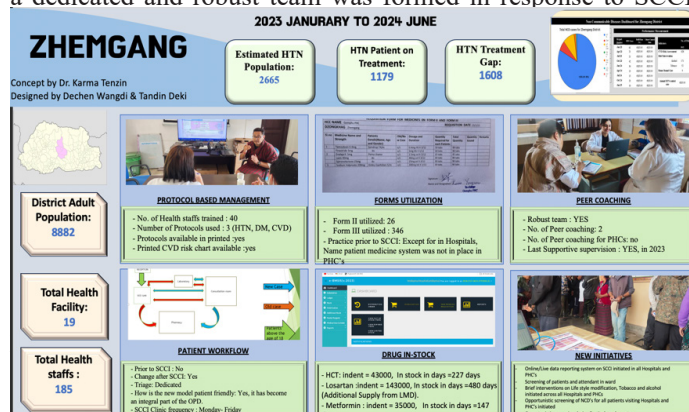


Figure 2. Non-communicable diseases factsheet for Zhemgang district.

Sarpang, located in the southern belt of Bhutan and sharing border with India, it is divided into 12 Gewogs with a total population of around 23000 adult population census record(2, 9, 12). The district has 13 health centers with a central regional referral hospital included. Initially a health staffs from CRRH and Sarpang hospital were given a five-day ToT training in Phuentsholing along with members of other Dzongkhag. These trained staffs then gave training to other staffs within their respective department. Following this, the core team conducted a 3-day training in 2 batches for staffs of the Primary Health Care centers of Sarpang Dzongkhag, Sarpang Hospital and CRRH. SCCI being a diverse approach, the non-clinical staffs (Reception, Administration, supporting staffs) were also trained irrespective of their designation as shown in figure 03.



Figure 3. Non-communicable diseases factsheet for Sarpang district.

A UNIQUE GOVERNANCE STRUCTURE IN SCCI IMPLEMENTATION

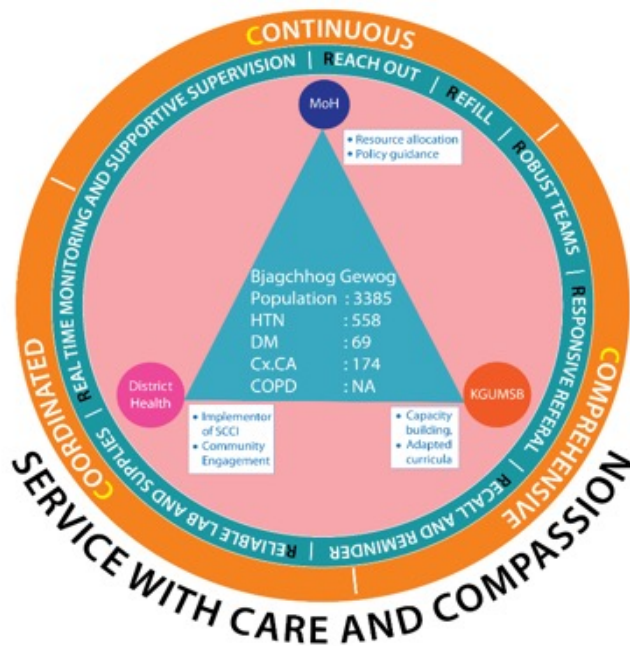


Figure 4. The 7 R's of SCCI.

Recognizing SCCI as a priority, the Ministry of Health formed a three-way partnership with District Health Authorities and KGUMSB to expand and scale up the initiative across all 20 districts in Bhutan.

As demonstrated above in figure 04, the Ministry provided leadership and served as the custodian of the overall vision, mobilizing resources crucial for implementation. KGUMSB, as an academic institute, contributed technical expertise, research capabilities, and data management, serving as a bridge between the Ministry and district health authorities. They supported districts with fieldwork and offered technical guidance to Ministry.

District health authorities played a pivotal role in translating the Ministry's vision and KGUMSB's capacity-building efforts into action within their respective districts. They were responsible for operationalizing the 7Rs and 3Cs framework, ensuring effective implementation of this concept on the ground.

WHO PEN to support people with NCDS through Universal Health Coverage (UHC) (13,14). UHC enables everyone to access the services that address the most significant causes of disease and death, and ensures that the quality of those services is good enough to improve the health of the people who receive them. Efficient use of limited health care resources, sustainable health financing mechanisms, access to basic diagnostics and essential medicines and organized medical information and referral systems are imperative for provision of equitable care for people with and at risk of NCDs(9, 15) también conocidas como enfermedades crónicas, suelen ser de larga duración y son el resultado de una combinación de factores genéticos, fisiológicos, ambientales y del comportamiento. Cada año mueren 41 millones de personas a causa de estas enfermedades, lo que equivale al 71% de todas las muertes en el mundo. Esta versión del Conjunto de intervenciones esenciales de la OMS contra las enfermedades no transmisibles para la atención primaria de salud se ha elaborado con el objetivo de integrar las ENT en la atención primaria de salud y de servir de apoyo a las reformas que deben trascender los elementos básicos del sistema nacional de salud. Proporciona protocolos y herramientas para las enfermedades crónicas que fortalecen la capacidad nacional de integrar y ampliar a mayor escala la atención de estas enfermedades en la atención primaria de salud. El conjunto de intervenciones esenciales de la OMS contra las ENT ayudará a mejorar la cobertura de los servicios adecuados para las personas que los necesitan en entornos de atención primaria.”, ”author”: [{ “dropping-particle”: “.”, ”family”: “World Health Organization (WHO).

IMPLEMENTING NCDS CONTROL STRATEGIES WITH THE 7Rs APPROACH

1. Robust Team

In each of the four districts, a robust team with clearly defined roles for each member developed. These teams were led by the senior health assistant in Bumthang, pharmacist in Zhemgang, senior nurse in Mongar and dental surgeon in Sarpang. Furthermore, all the clinical and non-clinical staffs were trained to provide services to the NCD patients and homebound patients using the concept of 7Rs and 3Cs in their respective districts.

A strong team at Mongar benefited with redistribution of tasks (*task shifting*) among the team which made the services more dynamic, resulting in an overall change in approach to patient care and work environment. Increased interaction within the team further fostered further trust and confidence and also increased community-based support and cooperation.

The multidisciplinary approach (*team-based approach*) in Bumthang improved service delivery by moving away from the traditional single-focus method. Diabetic patients, for example, benefited from the combined expertise of a nutritionist and a doctor. Efficient communication ensured seamless care, preventing treatment gaps and reducing errors. Shared decision-making empowered healthcare professionals to make informed choices. A diverse team, including clinicians, researchers, and technology experts, brought unique perspectives and explored new modalities of service provision (*for instance, a patient as an educator*), diagnostic tools, and preventive strategies.

Robust team has aided Zhemgang with patient centered care, combating NCDs by understanding the patient's individual needs and preferences. With formation of patient flow system and a strong team, patients were able to interact with various health professionals such as clinicians, nutritionist, pharmacist, lab technicians and health assistants, therefore bringing high level of satisfaction to the patients with NCDs.

In Sarpang, a robust team fostered a sense of shared responsibility, enabling effective and efficient patient management despite limited resources. Team members from various departments created an effective system, ensuring each department understood its role. This multidisciplinary approach provided integrated services for the prevention, diagnosis, treatment, and management of NCDs. Clearly defined roles and responsibilities prevented overlaps and gaps, enhancing the team's overall strategy. This structure facilitated advocacy and screening, reaching a maximum number of patients and attendants, and coordinated efforts between remote primary health centers (PHCs) and district and regional hospitals.

2. Recall and reminder

In Mongar, either the patient or their village health workers were communicated via mobile whenever a patient misses the follow up deadlines. This resulted in majority of patients continued the medications, except for some proportion where it was difficult to contact.

Bumthang adopted a structured approach using patient cohorts based on specific NCDs and treatment plans. This allowed healthcare providers to organize and prioritize recall and reminder activities. For instance, diabetic patients were grouped for targeted interventions on medication adherence and blood glucose monitoring. A dedicated team ensured consistent follow-up with patients, fostering trust and compliance. Educating patients about their disease, treatment options, and lifestyle modifications encouraged active participation in their care, enhancing long-term health outcomes and ownership of their well-being.

In Zhemgang, efforts to personally contact patients missing their refills and checkups have faced challenges as of June

2024. Zhemgang being a small community, it is easy to trace and ask people about their medication and encourage responsibility by explaining the consequences of missing follow-ups. The focus has been on empowering patients in self-management and building trustful relationships.

Since SCCI started recently in Sarpang, the team haven't begun recalling and reminding patients yet, but they have plans to implement this effectively. Patients are being briefed at every appointment before leaving the SCCI clinic. They plan to use multiple communication channels, including SMS, phone calls, and mobile apps, to reach patients. For those who miss appointments, staff will make personal phone calls to emphasize the importance of attending.

3. Refill

Medication refills for NCDs are managed by key personnel at various levels. At primary levels, health workers handle refills using Form III, while pharmacists use Form II at higher levels.

In Mongar, a google sheet shared with the pharmacist streamlines the process, allowing patients to collect medications locally, saving time and travel costs. Bumthang also uses Google Sheets to track prescriptions and refill schedules, collaborating with higher-level facilities to ensure medication availability at district hospitals.

In Zhemgang, pharmacists manage Form II and III requisitions, sending prescriptions as soft copies to higher centers. This approach saved a rheumatoid arthritis patient from traveling long distances for medication as shown in figure 05 below.



Figure 5. Utilization of Form II and III at Yebilepsa hospital, Zhemgang.

In Sarpang, patient education on medication adherence and refill processes is emphasized. Health Assistants and GDMOs facilitate refills through phone calls and online portals, collaborating with pharmacies to ensure timely transfers, benefiting patients by reducing travel needs.

4. Responsive referrals.

Mongar uses a mix of on-site and virtual interactions, employing social media platforms (whatsapp groups) to discuss cases and referrals with PHC staff. They inform the receiving personnel about referral details, send patients for consultations, and update patient care after interventions.

In Bumthang, responsive referrals, especially for chronic kidney disease and other NCDs, involve lab checks and arranging specialist appointments (telephonic call) in Thimphu and Gelephu, ensuring efficient coordination for specialized treatment.

In Zhemgang, the NCD clinic's in-charge handles responsive referrals by photographing reports needing follow-up and sharing them in the PEN Hearts group chat, informing the relevant health centers for further referral.

5. Reach-out services

In Mongar, reach-out services are conducted by the NCD focal person or doctor, depending on the patient's needs. They identify priority patients, evaluate their care requirements, and form a visiting team. This team assesses patient needs, communicates with patients and village health workers, prepares necessary equipment, schedules visits, and plans additional interventions.

In Bumthang, the team ensures follow-up care for individuals unable to access health services, currently serving 49 homebound patients from the hospital and 108 from five primary health centers. They deliver medications using personal and government cars, led by the NCD focal person.

In Yebileptsa, health assistants ensure timely delivery of catheters and medications to a bedridden patient. Pharmacists in Zhemgang keep patient medication records and pre-pack medications for distribution.

Sarpang's outreach clinic, led by the HA and GDMO, conducts regular follow-ups for bedridden patients, providing education and awareness about palliative care and available services, including home visits, illness management, and psychosocial support for patients and caregivers.

6. Reliable supply.

The implementation of the SCCI has significantly enhanced the reliability of drug supplies such as losartan, hydrochlorothiazide and metformin at primary health care centers. There is consistent

availability of the tools required for the monitoring of diabetes like the glucometers ensuring continuous patient care.

Additionally, the Ministry of Health has committed to maintaining high standards for all the supplied equipment, with uniformity and accuracy in the values they generate. SCCI ensures patient receive consistent care with their dependable supply chain.

7) Real-time mentoring, supportive supervision and peer coaching

In Bumthang, real-time mentoring via Google Sheets tracks NCD follow-ups and healthcare initiatives, ensuring prompt guidance for effective patient care. Supportive supervision includes PHC visits for mentoring the staff, with colleagues from one PHC coaching others to enhance patient care. Over the past two years, Bumthang has conducted 22 peer coaching sessions and 10 for PHCs, funded by the program. Zhemgang conducts annual mentoring and supervision at primary health centers, led by the Medical officer, NCD focal person and district health officer. They've performed 2 peer coaching sessions but haven't extended all the PHCs within the districts due to many challenges. The last supervision was in mid-2023, focusing on sensitizing new staff to SCCI and new tools.

In Mongar, the robust team from the Referral hospital mentors PHCs, visiting annually for supportive supervision using checklists to note achievements and challenges. They've conducted 7 peer coaching sessions and 3 for PHCs, with the latest supervision in May 2024.

Sarpang, led by its focal person have trained 228 health staff. They've conducted a total of 7 peer coaching sessions including 2 for PHCs within two months of SCCI implementation, emphasizing efficient capacity building as shown in figure 06.



Figure 6. Peer coaching session at Bumthang hospital.

ENHANCED OUTCOMES THROUGH SCCI INNOVATIONS

The implementation of SCCI has brought about notable changes in the work culture:

- Workload:** At Bumthang and Zhemgang, since all visitors to health centers were screened for NCDs using the concept of “*Opportunistic screening*”. There was significant reduction the workload on doctors as many old cases and stable NCD patients were managed by NCD unit. In Mongar, digitizing health records minimized paperwork and provided stakeholders with real-time data. Conversely, the workload at PHCs has increased while decreasing at the district hospital in Sarpang.
- Service quality:** SCCI significantly improved primary healthcare delivery in Mongar by fostering a robust team and implementing task sharing among health assistants at PHCs, enhancing service accessibility and efficiency. The district focal person played a crucial role in overseeing SCCI activities, ensuring data accuracy and accessibility.

In Zhemgang and Bumthang, post-SCCI implementation, NCD staff maintained detailed patient files, facilitating efficient management and streamlined pharmacy operations, including prepacking medications and providing door-to-door health assessments. All necessary examinations and lab tests were conducted as per educational programs for health workers and patients, such as fundoscopy for diabetic patients and routine dental checks.

In Sarpang, reduced patient queues have enabled more time and improved services at both the district and regional hospitals.

- Patient satisfaction and compliance** – Although measuring satisfaction levels can be challenging, there was a noticeable improvement in patient compliance with treatment and management as per new treatment protocols. Patients are happier as they can save the waiting time and transportation cost due to easier access to the health care. Furthermore, telephonic fixing of appointment with doctors at higher health centers have further been a noticeable change.
- Health Systems Impact:** Implementing well-planned screening processes through creation of “*NCD triage corner*” concept have facilitated towards the aims to reduce premature deaths and complications from NCDs as shown in figure 07.

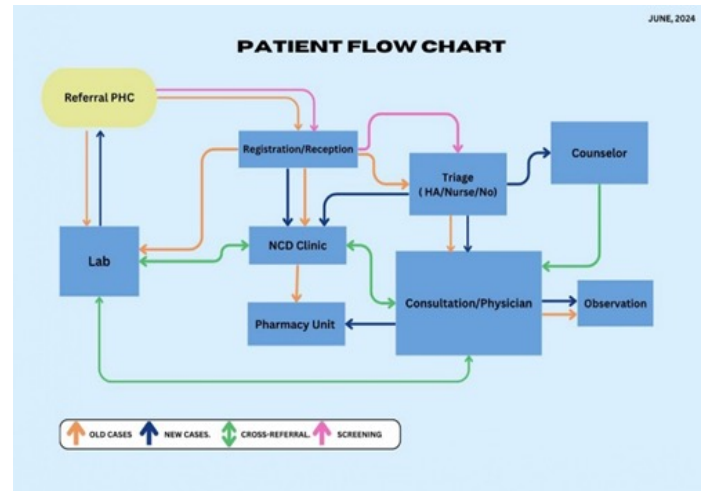


Figure 7: Revised patient work flow chart for smooth NCD patient management in hospitals.

This proactive strategy seeks to lessen the future complexities and complications, benefiting the health system. Protocols for the management of CVD, CRD, Diabetes and hypertension has been produced for the care of patients in the PHC level. These protocols are for delivery of a minimum set of essential interventions addressing the four major NCDs.(10)

- Data generation:** Furthermore, SCCI has enhanced data generation and reporting, utilizing a national dashboard to streamline data recording and reduce duplication, please refer figure 08. Improved patient care and enhanced treatment compliance are expected to further reduce complications, ultimately lowering future treatment costs and burdens.



Figure 8. National NCD dashboard as of August 2024.

CHALLENGES IN SCCI IMPLEMENTATION

- Service Delivery Related:** The increase in NCD screenings, especially lab tests, has posed challenges in managing the volume efficiently.

Mongar addressed staff shortages and equipment deficits by investing in essential equipment, ensuring timely drug supply, and conducting extensive training to bridge skill gaps.

Bumthang and Zhemgang struggled to adapt service delivery methods for long-serving staff, facing resistance in learning new techniques and approaches.

Sarpang contends with limited budget for home-based care and human resource constraints at PHCs, increasing workload for Health Assistants (HAs) and General Duty Medical Officers (GDMOs).

- b) **Health Systems Related:** Challenges in service provision include limited access to basic equipment like BP apparatus, compounded by insufficient financial support for essential needs such as staff refreshments post-homebound patient care, impacting staff morale. Human resource shortages are a significant hurdle, affecting NCD screening and record-keeping due to inadequate trained personnel.

All four districts encounter similar challenges of frequent turnover among key personnel, mitigated through succession planning, clear SCCI process documentation, and seamless training material transitions during personnel changes

- c) **Patient related** – Challenges were faced in the recall and reminder component, when patients had low self-awareness about their condition and those who didn't have care givers at home thus not being able to reach for the routine services. Frequent change in contacts were common problems for all four districts.
- d) **Other Significant Challenges:** One significant challenge in success driving this initiative is timely monitoring and evaluation with sustainable financing for SCCI intervention. Also, incentivizing the stakeholders engaged also was perceived as one of the key to successful implementation and mainstreaming of this noble initiative.

CONCLUSIONS

In conclusion, SCCI implementation with framework of 7Rs and 3Cs in the districts of Bumthang, Mongar, Zhemgang, and Sarpang districts of Bhutan has been pivotal role in showcasing role of SCCI in addressing non-communicable diseases in Bhutan. These efforts include promoting healthy lifestyles, early NCD detection through opportunistic screening all people visiting health facilities, use of form III and II to procure medicine from high health centers. Additionally, use of protocol-based management of those affected by NCDs to control and prevent or delay complications due to NCDs.

SCCI has also notably improved data management and healthcare efficiency across these districts. Despite challenges such as staff turnover and resource constraints, Bhutan has made significant strides in NCD management thanks to teamwork and the dedication of healthcare workers.

Acknowledgment

Heartfelt gratitude to WHO for providing with necessary funds to carry out SCCI activities. Without financial support, we would not have been able to make progress we have.

We express our sincere appreciation to the Ministry of Health for their invaluable support and guidance throughout the implementation of the service.

A special thank you to KGUMSB and FNPH for their dedication and commitment to making the SCCI project a remarkable success for the Bhutanese community.

We extend our heartfelt gratitude to everyone involved in compiling data and providing essential details. We would not have been able to complete our work without their assistance.

We also wish to thank all the dedicated health staffs who tirelessly worked to provide care to patients with Non-Communicable Diseases. Their commitment has been the major reason behind successful implementation of SCCI.

Lastly, we express our sincere thanks to patients who diligently followed medical advice and treatment protocols which played a crucial role in achieving positive health outcomes

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Advancing Bhutan's education

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Bhutan is at a pivotal crossroads in its development journey. The country has graduated from the Least Developed Country status to a developing country status in 2023 and is exposed to considerable challenges and opportunities. Barely recuperating from the economic damages caused by the COVID-19 pandemic and having to brace with the rapidly evolving regional and global socio-political and economic landscapes, Bhutan has more complexities in its transformation journey (United Nations, 2022). The establishment of the Gelephu Mindfulness City (GMC) under the visionary stewardship of His Majesty The King as a futuristic independent city, and an economic and spiritual hub wrapped in Bhutanese culture, is designed as a cradle for growth and innovation within the nexus of spirituality and sustainability (Jackson, 2024). To this effect, His Majesty has also called for an enlightened entrepreneurial bureaucracy to not only support the realisation of the GMC but also to continuously build a knowledge-driven, resilient and forward-looking citizens (Levi, 2026). These transitions need to be reinforced by the transformation of the human capital and the national consciousness. At the heart of it is education.

The world into which the younger generations are entering is vastly different from that of the previous generations. Artificial intelligence, automation, climate uncertainty, geopolitical disruptions, digital economies, and rapidly changing labour markets are redefining the nature of work, citizenship, leadership, and human interactions. Traditional educational models based on structured programs and standardised conformity are increasingly becoming irrelevant to the evolving times and circumstances. As a tool for social engineering, Bhutan's education needs to address the requirements of the younger generations while providing them platforms to exhibit their skills and competencies enabling them to lead successful lives and contribute meaningfully to nation-building. Thus, innovative education must be the key for Bhutan, and it needs to be understood as cultivating curiosity, creativity, adaptability, emotional intelligence, ethical leadership, and systems thinking (Organisation for Economic Cooperation and Development, 2018). Innovative education is not only about preparing citizens for gainful employment, but for meaningful participation in society.

Bhutan possesses a unique advantage in this transformation. The development philosophy of Gross National Happiness (GNH), which prioritises holistic wellbeing, provides an extraordinary opportunity to adapt an education system that balances innovation with humanity, technological advancement with moral wisdom, cultural identity, and economic ambition. His Majesty The King has consistently commanded for an

education system of the highest standards to address the physical, emotional, psychological, intellectual and moral make of the students and provide quality education with an equal emphasis on the local and trans local knowledge, skills and values (The Bhutanese, 2021). This means that the future of education needs to be understood as sharpening the intellectual quotient along with nurturing youngsters with the socio-emotional and ethical skills (Manyukhina, 2025). Our younger generations must, therefore, embody global competencies while remaining deeply grounded in the Bhutanese ideals of tsa-wa-sum, tha damtshig and driglam choesum (Wangdi and Boossabong, 2024).

Therefore, education must no longer operate in isolation from the realities of society, industry, governance, and the environment. Instead, learning ecosystems must become interdisciplinary, experiential, collaborative, and problem-solving oriented. This transformation demands a reimagining of educational institutions. Educational establishments need to be shaped as centres of innovation, introspection, and transformation. They need to be chiselled as centres of humanistic engineering and incubators of ideas, entrepreneurship, and technological adaptation.

To achieve this mission, the role of educators needs to be transformed as well. Educators today are no longer mere transmitters of knowledge. They need to evolve as mentors, facilitators, ethical guides, and intellectual catalysts. Therefore, professional empowerment of educators must remain central to Bhutan's national transformation agenda. The educational reinvention requires strategic leadership, institutional agility, investment in research and innovation, stronger partnerships between academia and industry, international collaboration, and policies that encourage creativity and efficiency rather than bureaucratic rigidity. It also requires us to create pathways where young people can see meaningful futures within Bhutan itself, thereby addressing growing concerns surrounding youth migration and talent drain. Importantly, innovative education must also be inclusive and equitable. We need to have policies that provide equal opportunities to rural learners, differently abled students, economically disadvantaged and less privileged communities. Policies need to be innovative, inclusive and equitable as education continues to remain a powerful equaliser that provides opportunities for growth and bridges disparities across regions and social groups.

As Bhutan looks to the future, the development of the Gelephu Mindfulness City (GMC) presents an unprecedented opportunity for the younger generation to contribute meaningfully to nation-building. To prepare them for this sacred responsibility,

we must nurture imagination, innovation, and adaptability. Our education system, therefore, must be equally adaptive, multidimensional, and future-ready—one that empowers learners to continuously learn, unlearn, and reinvent themselves in a rapidly changing world.

Under the visionary and compassionate leadership of our enlightened Monarchs, Bhutan has its charted a unique development path rooted in the Buddhist values of interdependence, harmony and sustainable living. Our Kings have envisioned a future that harmonises technological progress with cultural resilience, economic growth with environmental stewardship, and innovation with human values. It is, therefore, the sacred responsibility of the educators, policymakers, and institutional leaders not merely to prepare young people for the future, but to empower them with the knowledge, skills and mindset to shape it. Education must therefore be reimagined to realise His Majesty The King's noble aspirations and enable greater progress, shared prosperity, and lasting peace – within ourselves, our communities, and the world.

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Published by:

**EduPlus Training Institute
Thimphu: Bhutan**

**bhutaneduplus@gmail.com
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