ORIGINAL ARTICLE

Integrated Primary Healthcare Delivery of Hypertension and Diabetes Services: A Task Analysis of Nurses and Doctors in Rural Philippines

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ABSTRACT

Objectives. This study aimed to describe the roles and responsibilities of doctors and nurses in managing conditions like hypertension and diabetes in rural areas.

Methods. This study employed a cross-sectional study design using the task analysis methodology. A self-administered questionnaire derived from a national health practice guideline was used. A combination of frequency, criticality, and performance was assessed to identify tasks that needed attention by educators and policymakers.

Results. Of the 142 health workers who participated in the study, 81% were nurses and 19% were doctors. The tasks most frequently performed by these professionals were taking vital signs (88.7%), recording patient history (87.3%), and advising patients on regular follow-ups (86.6%). In terms of criticality, the top three tasks were performing diagnostic tests for acute chest pain (50.8%), diagnosing neurological disorders (49.2%), and referring patients for specialized tests at other facilities (43.6%). However, the tasks perceived as most challenging or outside their capability were the Fagerstorm test for assessing nicotine dependence (57.5%), the AUDIT tool for identifying binge drinkers (55.5%), and fundoscopy for diagnosing diabetic retinopathy (54%).

Conclusion. The primary care practice of the participants typically involved tasks that are centered on health promotion or disease prevention. Many of the tasks are shared by doctors and nurses, with some highly critical tasks performed less frequently due to a lack of training. Pre-service courses may need to be revised to ensure that health professionals have the required skills to carry out shared tasks.

Keywords: diabetes mellitus, hypertension, primary health care, integrated health care systems, Philippines, cross-sectional studies

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INTRODUCTION

Overlapping risk factors between diabetes and hypertension might result in similar pathways of complications and premature morbidity and mortality. The urgency is increased by the facts that both diabetes and hypertension independently raise risk for both diseases. An opportunity for a unified paradigm for identification and management at the population level is presented by the overlap in the management of diabetes and hypertension.

Therefore, primary care is in a good position to serve as the foundation for the health system's integrated response to non-communicable diseases (NCDs). In the Philippines, however, the focus of the clinical management for NCDs has been hospital-centered acute care.[1] Patients usually seek

treatment at hospitals when complications start to affect their activities of daily living or when they experience acute events unmanageable at home. This approach is expensive and does not contribute well to the reduction of the burden of hypertension and diabetes.

A chronic shortage of skilled health professionals hinders the delivery of primary care services is an urgent concern that has immediate implications on Sustainable Development Goal 3 (SDG 3), especially on Target 3c, which highlights the need for a strong health workforce. In countries where NCDs like hypertension and diabetes mellitus are predominant drivers of morbidity and mortality, the lack of health workers significantly influences health outcomes.[2] Such is the case in the Philippines where more trained healthcare workers are needed to deliver services,[3] especially in the integrated management of hypertension and diabetes mellitus.

Most primary care services can only be performed by a physician.[3] About 60,000 primary care physicians are needed to meet the demand for primary health care.[4] At present, there are only 3.9 doctors per 100,000 population. The present doctor-to-population ratio is a far cry from the ideal 1 doctor per 20,000 population.[5] In 2020, four out of ten Filipinos died without ever having seen a doctor.[6] On one hand, the ideal nurse-to-population ratio is one nurse per 20,000 population.[7] In 2017, there were 8.6 nurses per 100,000 population and an average of two nurses in a rural health unit, indicating that there is an adequate number of nurses to meet the national standard.

Many low- and middle-income countries (LMICs) have contemplated task shifting due to a scarcity of doctors, uneven distribution of healthcare professionals, and financial limitations.[8–11] This approach involves redistributing specific duties within healthcare teams or transferring responsibilities from more qualified health workers to those with less specialization and shorter training durations, aiming to optimize the use of existing human resources.[12,13]

In countries with a high burden of NCDs and constrained healthcare resources and personnel, non-physician health workers such as nurses are increasingly being utilized to augment NCD care.[8–10,14] In the Philippines, for example, some roles—like immunization and family planning services—were shared by nurses and midwives. This denotes persistent informal task shifting and task sharing without policies and guidelines to prevent lowered care standards. The majority of doctors at rural health units provided only a few services, namely consultations and referrals.[15]

There remains a lack of evidence on the primary care practice of rural physicians and nurses including their competency to perform integrated services for patients with hypertension and diabetes mellitus, particularly in low-resource settings with a devolved healthcare system such as that of the Philippines. Therefore, task analysis emerges as a pivotal tool in healthcare, especially when strategizing for efficient service delivery.

In the context of the Philippines, where evidence on primary care practices in rural areas remains limited, task analysis offers a deeper insight into the existing practices, training, and educational backgrounds of health workers. This is instrumental when contemplating initiatives like task shifting. Notably, as observed from practices in North America and Africa, task analysis has been the cornerstone for benchmarking professional standards, updating training curricula, and designing licensing examinations.[16] Task analyses involving nurses and midwives were done in Africa in order to examine the scope of practice and standards for nurses in Lesotho,[16] evaluate the maternal-newborn nursing workforce in Mozambique,[17] pinpoint educational shortages in Liberia,[18] and create a licensure exam in Botswana.[19]

The evident knowledge gap in the Philippines stems from a paucity of comprehensive data on health worker practices, especially in the rural areas. Ambiguities surrounding the defined scope of professional roles, potential mismatches between on-the-ground needs and training programs, and the absence of unified standards further exacerbate this gap. In the pursuit of Universal Health Care (UHC) and integrated disease management, such as for hypertension and diabetes mellitus, task analysis can help ensure a standardized and efficient healthcare system.

Therefore, this study aimed to determine the frequency, criticality, training, and perceived competence to perform tasks for the integrated management of hypertension and diabetes by rural doctors and nurses, in order to identify gaps and recommend changes in pre-service education, in-service training, and scope of practice in preparation for task shifting thereby contributing to the achievement of UHC and SDG 3, especially Target 3c.

Ensuring access to primary care services has emerged as a global priority.[20] The healthcare infrastructure is undergoing restructuring, with anticipations of introducing new collaborative interprofessional models, including task shifting. Consequently, evaluating the potential of doctor-to-nurse task shifting in primary care becomes essential, especially when considering the roll-out of integrated care for hypertension and diabetes within the framework of UHC.

Our pursuit of UHC warrants further studies on skill mix, task shifting, interprofessional collaboration, and role expansion to fully optimize the existing health workforce. This study will add to the growing body of knowledge on task shifting in primary care in a low-resource setting, particularly in the management of NCDs. First, this study will provide information on the current status of hypertension and diabetes mellitus management in primary care. The documentation of the current practices can inform policies in task shifting as a means to address the shortage of higher-skilled health workers required to deliver integrated hypertension and diabetes mellitus services in primary care. Thus, improving patient access to health services and contributing to reducing the NCD burden in the Philippines.

METHODS

Study Design and Setting

This study employed a cross-sectional design using the task analysis methodology[21] to examine the practice of rural physicians and nurses in the integrated management of hypertension and diabetes mellitus in primary care. Given its effectiveness in identifying associations, adaptability to different methods of inquiry and contexts, efficiency, and suitability for descriptive and comparative studies, the cross-sectional research design is an appropriate method to employ with the task analysis approach. It's crucial to take into account that this design is limited to offering a snapshot at a specific moment in time and does not provide an analysis of cause-and-effect relationships.

The study was conducted in Benguet, a mountainous province in the northern portion of Luzon Island, Philippines. The province had been purposely selected as the study site due to its significant proportion of persons with hypertension and diabetes. Data from 2019 revealed that 21.7% of adults aged 20 and above in the province were newly identified as hypertensive, and 2.7% were diagnosed with type 2 diabetes mellitus, rates that surpass the national averages of 8.4% and 1.9%, respectively. Moreover, Benguet is a pilot area for the Universal Health Care (UHC) Act, aiming to establish a robust local healthcare provider network. As projected by the Department of Health (DOH), by 2040, Benguet will face the highest demand for primary care physicians within the Cordillera Administrative Region, underscoring the urgency of ensuring adequate health resources.[22,23]

Sample and Sampling Design

Purposive sampling was used in selecting participants that would most benefit the study. A total of 203 individuals were invited to participate. Of which, 166 were nurses while 37 were doctors. Since this study only looked into the public primary care system and will not attempt to infer conclusions from other populations, the target survey participants included the entire population of public health physicians and public health nurses in the province. The response rate was computed during data analysis.

Data Collection

Upon receipt of ethics approval, the study team secured a formal permission from government authorities to contact staff working at public primary care facilities for participation in this study. A list of nurses and physicians was obtained through the city/municipal health officers upon the endorsement of the local chief executive or city/municipal health officer. Target participants who met the selection criteria were informed about the study and were allowed to ask questions if there were any. After signing the written informed consent form, they may opt to fill out the self-administered survey questionnaire within the initial encounter with the researcher or they may opt to fill out the survey questionnaire completely at a later time. If they prefer the latter, a date was identified during which the study team personally collected the filled-out questionnaire from the participants. The study lasted for six months and the participants had the option to stop participating even if they agreed earlier.

Data Analysis

All quantitative analyses were conducted using SPSS version 28. Descriptive statistics was used to identify the demographic characteristics of the participants. Frequencies of responses by relative majority were analyzed for each cadre. Specific combinations of frequency, criticality, and performance were also examined to determine which tasks require attention.

Data Variables and Definitions

This study utilized the Philippines DOH's Omnibus Health Guidelines (OHG)[24] for Adults as the basis for the task list. The OHG was developed as the overarching policy issuance integrating key policy provisions governing various health programs and integrating various standards of care. The task analysis survey tool asked participants to measure each task in four key measurement areas (Table 1).

In other studies, the task list was developed by reviewing national documents relevant to the cadre. This is followed by a validation process involving a panel of experts. However, to align with current national policy, this study deemed it appropriate to use the DOH's OHG which laid down the specific tasks in NCD management of primary care providers.

The survey questionnaire was pre-tested for understandability and contextual appropriateness in a small number of individuals (4 physicians, 3 nurses) with similar characteristics as the target participants but was not part of the final sample. The findings during the pretest survey were used to further refine the data collection.

Ethics Approval

The study protocol was reviewed and exempted from ethics review by the University of the Philippines Manila (UPM) Research Ethics Board (REB) (UPMREB 2022-0651-EX). Written informed consent was provided by the participants.

Informed consent

Potential participants were invited to participate in the study through e-mail, phone call and other official government communication channels. The objectives of the study were explained to participants, and they were asked to sign an informed consent form to affirm approval to participate without deception, coercion, or undue influence. The informed consent form contained provisions on voluntary participation, and withdrawal at any point in the study. Participants were not asked to justify their decision to accept or withdraw participation from the study. The forms

Table 1. Key Measurement Areas and Responses per Category

Variable	Responses	Explanation
Frequency – how often is the task performed?	Daily	The health care worker completes the task at least once per day
	Weekly	The health care worker completes the task less than once per day but at least once per week
	Monthly	The health care worker completes the task less than once per week but at least once per month
	Rarely	The health care worker completes the task less than once per month
	Never	The health care worker lacks the opportunity to perform the task
Criticality – how critical is the task performance in terms of patient outcomes?	High	Failure to complete the task correctly or in a timely manner will lead to client death, serious disability, or major impact on public health
	Moderate	Failure to complete the task correctly or in a timely manner may lead to client death, serious disability, or major impact on public health
	Low	Failure to complete the task correctly or in a timely manner will have minimum impact on client or public health
Performance – how competent is the health worker with the task performance?	Proficient	The health worker feels they can perform the task well that they feel comfortable supervising others in the task performance; is an expert at the task
	Competent	The health worker is capable of performing the task safely, although may ask for supervision from a more experienced provider
	Not capable	The health worker may cause harm if the task is performed without supervision
Education – when/ where the health worker was trained/ educated to perform the task	Pre-service	The health worker received formal training as part of pre-service education
	In-service	The health worker received formal training needed to complete the task at some point after graduation
	On-the-job	The health worker received informal training from co-workers or supervisors once they began working
	Never trained	The health worker has received no formal or informal training for the task

indicated the degree and duration of participation that they will have for the study.

Vulnerability

Since health workers and employees may be vulnerable to coercion or undue influence due to belief that participation was necessary for employment, the voluntary nature of their participation was emphasized during the informed consent process.

Risks, benefits, safety

This study involved minimal risk. The risk of participating in the study was no more likely and no greater than the typical risks involved while working. There were no anticipated expenses to be incurred by the participants in the course of the study except for potential travel expenses. There was no direct benefit for the participants except for the reimbursement of travel expenses, phone load or internet fee, as applicable. While there was no direct benefit, they indirectly were affected by the potential improvements in the quality and delivery of health care. Snacks and a token of appreciation were provided to all participants.

During the face-to-face encounters, participants observed physical distancing. The session took place in a room where there was adequate ventilation without violating the participant's privacy. All participants, including the investigator, wore their face masks during the entire duration of the session.

Privacy and confidentiality

This study was compliant to the Data Privacy Act of 2012. No identifiable information was collected from the participants except for demographic data. Each participant was assigned unique codes. Participants were referred to in the study documents through the use of the codes. Only the primary investigator and his research assistant were granted access through a password to all materials relevant to the research.

Justice

Participants came from only one province. Health workers, program implementers, and officials from other regions of the country were not represented in this study. This choice was primarily due to convenience and resource constraints. The selection of participants to be included in this study did not bring any health or social inequalities.

Transparency

The investigator was transparent about aspects of the study that may impact the rights and safety of the participants, or in respect to information that may have a bearing on the participant's informed consent. Participants will be allowed to access their data anytime during the course of the study after submitting a written request to the principal investigator. Other researchers may also request access to the study's data through a formal letter of request in accordance with institutional policies. The principal investigator shouldered all the expenses of this study. No external funding was received from either government or private entities.

RESULTS

Participant characteristics

Out of the 203 invited individuals, there were 142 respondents (19% were doctors and 81% were nurses) in the survey, with a 70% response rate (Table 2). The mean age of the sample was 37 years old (SD = 8.3). The mean number of years worked is 6 years (SD = 6.4). The majority of the respondents were female (78.2%) and married (66.9%). Most of the respondents were college graduates (73.2%). The majority of the respondents were hired as job orders (52.8%). A huge number of them came from Baguio City (38%).

Frequency of performance

The top three tasks performed as reported by all participants: (5.2) vital signs, (2) comprehensive history taking, and (4) advise follow-up of patients. The top twenty tasks are shown in Table 3. The least frequently performed tasks were (5.12) Physical examination of external genitalia; (18) coordination regarding the provision of basic needs, in-kind support, psychosocial support, and spiritual support; and (5.6) oral examination.

Both doctors and nurses reported routine screening, risk assessment, and physical examination as the frequently performed tasks. The least frequently performed tasks by doctors involved screening tests for substance use, diagnostic tests for acute medical conditions, and tasks regarding palliative care and rehabilitation. Nurses, on the one hand, reported that they less frequently perform tasks involving physical examination of outer extremities, palliative care, and diagnostic tests for acute and emergency medical conditions such as neurologic disorders.

Criticality of task

The top three highly critical tasks were (9.5) Diagnostic test - acute chest pain, (9.1) Diagnostic test - acute neurologic symptoms, and (11) referral to higher facilities for more specialized tests. Meanwhile, the top three tasks reported as low critical include (5.7) Physical examination: Chest; (5.1) Physical examination: General survey; and (23) Encourage to participate in the development and formulation of psychosocial care or clinical treatment plan and give informed consent before receiving treatment or care, and uphold the right to withdraw such consent.

Table 2. Characteristics of Survey Respondents

Characteristics		Total (n=142)		Doctor (n=27)		Nurse (n= 115)	
		Mean	SD	Mean	SD	Mean	SD
Age		37	8.3	44	11.1	35	6.5
Number of Years Worked		6	6.4	10	9.4	5	4.8
Characteristics	Categories	Count	%	Count	%	Count	%
Sex	Female	111	78.2	20	74.1	91	79.1
	Male	28	19.7	7	25.9	21	18.3
	Prefer not to say	3	2.1	0	0.0	3	2.6
Civil Status	Married	95	66.9	22	81.5	73	63.5
	Single	45	31.7	4	14.8	41	35.7
	Widowed	2	1.4	1	3.7	1	0.9
Educational attainment	College graduate	104	73.2	0	0.0	104	90.4
	Post-graduate	36	25.4	26	96.3	10	8.7
	Other	2	1.4	1	3.7	1	0.9
Employment Type	Contractual/job order	75	52.8	3	11.1	72	62.6
	Permanent	67	47.2	24	88.9	43	37.4
Location	Atok	9	6.3	2	7.4	7	6.1
	Baguio City	54	38.0	15	55.6	39	33.9
	Bakun	4	2.8	1	3.7	3	2.6
	Bokod	5	3.5	1	3.7	4	3.5
	Buguias	11	7.7	1	3.7	10	8.7
	Itogon	11	7.7	1	3.7	10	8.7
	Kabayan	12	8.5	2	7.4	10	8.7
	Kapangan	5	3.5	0	0.0	5	4.3
	Kibungan	6	4.2	2	7.4	4	3.5
	La Trinidad	9	6.3	1	3.7	8	7.0
	Mankayan	6	4.2	0	0.0	6	5.2
	Sablan	4	2.8	0	0.0	4	3.5
	Tuba	1	0.7	0	0.0	1	0.9
	Tublay	5	3.5	1	3.7	4	3.5

Education

The majority of the respondents were more likely to report that they had pre-service education for the tasks evaluated (19 out of the 54 tasks) or were never trained (14 out of the 54 tasks). The following are the top three tasks that were trained pre-service: (5.2) vital signs, (5.3) anthropometrics, and (5.4) skin inspection and palpation.

For the tasks trained on the job, the top three tasks were: (18) coordination regarding the provision of basic needs, in-kind support, psychosocial support, and spiritual support, (8.1) PhilPEN Risk Factor Assessment, and (19) advise patients properly about home-based palliative and hospice care.

For the tasks trained in-service, the following were the top three tasks: (23) encourage adult patients to participate in the development and formulation of psychosocial care or clinical treatment plan and give informed consent before receiving treatment or care, and uphold the right to withdraw such consent; (22) encourage adult patients to ensure that the supply of prescribed medications, especially maintenance medications, is uninterrupted and available at home, (24) encourage adult patients to designate a person of legal age to act as their own legal representative, in the event of loss of decision-making capacity.

Lastly, the top three tasks the respondents were never trained for include the following: (8.2) Screening test: Fagerstrom Test, (8.3) Screening test: AUDIT tool, and (6.1) Physical examination: Fundoscopy

Performance

The majority of the sample were more likely to report that they were "competent" to perform the tasks evaluated. The top three tasks for which the respondents rated they are not capable of performing include (8.2) Fagerstorm test, (6.1) Fundoscopy, and (8.3) Screening test: AUDIT tool. Meanwhile, the top three tasks for which the respondents stated they are competent to perform are: (16) incorporate the principles of palliative care in primary care management,

Table 3. Top 20 Most Frequently Performed Tasks as Reported by Both Nurses and Doctors (combined)

Rank	Tasks
1	5.2 Physical Examination: Vital signs (BP, RR, HR, temperature)
2	2 Risk Factor Assessment: Perform comprehensive history taking, including the history of present illness, past medical history, family history, personal, social, and occupational history
3	4 Risk Factor Assessment: Advise follow-up of patients at regular intervals in rural health units, urban health centers, birthing centers, social hygiene clinics, and other similar health facilities depending on the individual's risk level
4	22 General Advice: Encourage adult patients to ensure that the supply of prescribed medications, especially maintenance medications, is uninterrupted and available at home.
5	1 Risk Factor Assessment: Screen asymptomatic adults 20 years old and above for risk factors using complete history taking and physical examination at the initial visit, and at regular intervals thereafter depending on the risk level
6	5.3 Physical Examination: Anthropometrics (height, weight, BMI, waist circumference)
7	21 Risk Factor Assessment: Advise and/or counsel adult patients to: a. Adhere to the treatment regimen; b. Observe and immediately report signs and/or symptoms of adverse drug reactions
8	9.2 Diagnostic Tests: Hypertension: BP measurement using a validated oscillometric BP device with an appropriately-sized upper arm cuff, according to the standard BP measurement protocol
9	5.1 Physical Examination: General survey (inspection)
10	13 Supportive Therapy: Educate patients about supportive therapy for symptomatic relief, including non-pharmacologic interventions and pharmacologic interventions, their right dosing, and their possible side effects/adverse effects.
11	5.4 Physical Examination: Skin (inspection, palpation)
12	23 General Advice: Encourage adult patients to participate in the development and formulation of psychosocial care or clinical treatment plan and give informed consent before receiving treatment or care, and uphold the right to withdraw such consent
13	5 Physical Examination: Perform a complete screening physical examination in well or asymptomatic adults
14	7 Screening Tests: Initiate additional screening appropriate to the patient's condition and the identified risk factors from the history-taking and physical examination
15	8.1 Screening Tests: PhilPEN Risk Factor Assessment
16	3 Risk Factor Assessment: Request for additional tests or targeted screening if the risk factors that were identified place an individual at higher risk for developing a specific disease
17	5.5 Physical Examination: Head/HEENT (inspection, palpation, auscultation, otoscopy, fundoscopy as needed)
18	5.8 Physical Examination: Lungs (inspection, palpation, percussion, auscultation)
19	5.7 Physical Examination: Chest (inspection, palpation, percussion, auscultation)
20	24 General Advice: Encourage adult patients to designate or appoint a person of legal age to act as their own legal representative, in the event of loss of decision-making capacity

(17) offer palliative care measures; and (18) coordinate with the LGU, community support groups, or partner/advocacy organizations regarding the provision of basic needs, in-kind support, psychosocial support, and spiritual support to patients.

Finally, the top three tasks that respondents feel they are most proficient to perform are: (5.2) vital signs, (5.3) anthropometrics, and (9.2) Diagnostic test: BP measurement

Cross tabulations

The following presents the results of cross-tabulations for all participants, relevant to improving education, training, regulation, and practice.

Infrequent, highly critical (Table 4)

As expected, diagnostic tests for acute conditions, such as acute neurologic symptoms and acute chest pain, are infrequently done yet reported as highly critical tasks. These conditions are highly critical and may lead to morbidity or mortality.

More frequent, low critical (Table 5)

The respondents reported that task 5.3 [Physical Examination: Anthropometrics (height, weight, BMI, waist circumference)] was the most frequently done task yet rated with low criticality. Other routine physical examination tasks (general survey, vital signs, skin inspection, palpation, Head/HEENT, and extremities examination) were also rated as tasks that they perform frequently but have low criticality.

High criticality, non-pre-service education (Table 6)

Diagnostic tests for acute chest pain were perceived as having the highest criticality but were not covered in pre-service education. Among the participants, 26.8% were never trained to perform this task. This task was also reported as a less frequently performed but highly critical task.

There are seven other diagnostic test tasks that were perceived as highly critical but were not included in the pre-service education. Only nine (6.3%) reported that they were never trained to perform referrals to higher level facilities for more specialized tests, as necessary and as appropriate for the patient's condition.

High criticality, low perceived competence (Table 7)

Diagnostic tests on acute neurologic symptoms, acute chest pain, and referral to higher level facilities for more specialized tests are tasks that the participants perceived to have low competence but regarded as highly critical. These tasks were also perceived as less frequent but highly critical tasks.

Participants perceived that they have the lowest competence with the task "Incorporate the principles of palliative care in primary care management, by preventing and relieving the most common and severe types of suffering associated with serious or complex health problems."

DISCUSSION

Through this task analysis, we found that some tasks are shifted from doctors to nurses. This is expected as task shifting in the Philippines has been reported to go beyond the doctor and the nurse, and includes other members of the health care team such as midwives and BHWs[15] as seen in other countries.[12]

Physicians, in general, have a wide range of acts or services constituting their practice of medicine in the country. Along with doctors of dental medicine, registered physicians or medical doctors possess the right to prescribe treatment and/or procedure to diagnose, treat or prevent a health condition. Other professions, such as registered nurses and registered midwives, also possess a wide range of acts or services within the scope of their practice. However, special training is often warranted for other services that are not typically provided by these professions.

In 2020, the DOH and Professional Regulation Commission issued Joint Administrative Order (JAO) No. 2020-01 which provides the guidelines for the certification of primary care workers for universal health care. This JAO, in congruence with the UHC Act, recognizes licensed physicians, nurses, midwives, and other health professionals as qualified to apply for competency assessment towards certification as primary care worker. The competencies expected from these primary care workers, however, are limited by their legal scope of practice. This prevents the expansion of practice to include other responsibilities in NCD management that are currently exclusively performed by licensed physicians.

Ideally, a republic act expanding the scope of professions will be the appropriate legal framework to regulate task shifting in the Philippines. At present, laws present a barrier to the development and implementation of a comprehensive policy on task shifting. However, the same laws also provide insight as to what acts or services may be shared between health workers or shifted to other health workers with adequate training or qualification.

Majority of participants formally take on tasks that were either transferred from another cadre or that were not initially a part of their training, as also observed in another study.[15] This necessitates the modification of areas of practice and the development of new cadres, such as those at the assistant level. Thus, a task-shifting and task-sharing policy should be created to codify the shifting and sharing practices already in place, emphasizing the importance of proper training and monitoring.[15]

Greater emphasis should therefore be given to achieving the required competencies that will address health needs. To ensure that health professionals have the required skills to carry out shared tasks based on the task analysis, pre-service courses may need to be revised. Harmonizing scopes of practice, updating current professional laws, and promoting collaboration between health workers are essential to maximize the available human resources.

Table 4. Cross Tabulation of Top 20 Tasks Reported as Low Frequency, High Criticality

Top Task (1-20, with ties)	less frequently and high criticality		less frequently		high criticality	
	n	%*	n	%*	n	%*
Acute Neurologic Symptoms: *1) Basic Emergency Assessment (Airway, Breathing, Circulation, Disability, Exposure); 2) FAST (Face Arm Speech Test) for rapid assessment; 3) Capillary blood glucose to check for hypoglycemia*	28	19.7	66	46.5	63	44.4
Acute Chest Pain (suspected acute coronary syndrome): *Basic Emergency Assessment, 12-L ECG within 10 minutes of presentation, provided it does not delay transfer to the nearest ED*	24	16.9	50	35.2	65	45.8
Offer referral to higher levels if care to patients with signs, symptoms, or concerns needing specialty care and rehabilitation	17	12.0	55	38.7	50	35.2
Stable ischemic heart disease/chronic stable angina pectoris: *12-L ECG*	16	11.3	54	38.0	51	35.9
Refer to higher-level facilities for more specialized tests, as necessary and as appropriate for the patient's condition.	16	11.3	48	33.8	58	40.8
Fundoscopy (to assess diabetic retinopathy)	13	9.2	41	28.9	28	19.7
Inspection of the cornea, eyelids, extremities (to assess hypercholesterolemia)	13	9.2	58	40.8	27	19.0
Offer palliative care measures such as but not limited to: a. Medications that help relieve specific symptoms or types of suffering b. Non-pharmacologic interventions to help alleviate suffering and improve quality of life	13	9.2	70	49.3	33	23.2
Observe proper legal procedures in securing advanced directives	12	8.5	52	36.6	31	21.8
Coordinate with rehabilitation providers, including rehabilitation medicine specialists, physical, occupational, and speech therapists, within the HCPN, to ensure the seamless transition from specialized to primary care and reintegration into the community of patients	11	7.7	64	45.1	36	25.4
Coordinate with the LGU, community support groups, or partner/advocacy organizations regarding the provision of basic needs, in-kind support, psychosocial support, and spiritual support to patients	11	7.7	75	52.8	28	19.7
Alcohol, Smoking, and Substance Involvement Screening Test (ASSIST) Tool	10	7.0	63	44.4	20	14.1
Advise patients properly about home-based palliative and hospice care	10	7.0	70	49.3	29	20.4
Request diagnostic tests appropriate to the individual's presentation and clinical impression	9	6.3	29	20.4	38	26.8
Type 2 diabetes*: FBS or 75g OGTT*	9	6.3	38	26.8	33	23.2
Request diagnostic tests in a rational manner and interpret their results promptly and accurately, particularly when those tests are available at the primary care level, in order to create an accurate clinical impression of the patient's condition and initiate timely and appropriate management	9	6.3	44	31.0	44	31.0
Incorporate the principles of palliative care in primary care management, by preventing and relieving the most common and severe types of suffering associated with serious or complex health problems	9	6.3	62	43.7	34	23.9
Request for additional tests or targeted screening if the risk factors that were identified place an individual at higher risk for developing a specific disease	8	5.6	32	22.5	37	26.1
Dyslipidemia: lipid profile	8	5.6	47	33.1	33	23.2
General survey (inspection)	7	4.9	23	16.2	30	21.1
External genitalia (inspection, palpation)	7	4.9	79	55.6	22	15.5
Initiate additional screening appropriate to the patient's condition and the identified risk factors from the history taking and physical examination	7	4.9	39	27.5	31	21.8
CVD Risk Screening and Assessment Tool (WHO) and ASCVD Risk Calculator	7	4.9	42	29.6	28	19.7
Fasting Bood Sugar or 75g oral glucose tolerance test (OGTT)	7	4.9	40	28.2	23	16.2
Encourage adult patients to designate or appoint a person of legal age to act as their own legal representative, in the event of loss of decision-making capacity	7	4.9	44	31.0	30	21.1

**uses valid N, takes into account missing entries*

Table 5. Cross Tabulation of Top 20 Tasks Reported as High Frequency, Low Criticality

Top Task (1-20, with ties)	more frequently and low criticality		more frequently		low criticality	
	n	%*	n	%*	n	%*
Anthropometrics (height, weight, BMI, waist circumference)	41	28.9	119	83.8	49	34.5
Perform comprehensive history taking, including the history of present illness, past medical history, family history, personal, social, and occupational history	38	26.8	124	87.3	43	30.3
Screen asymptomatic adults 20 years old and above for risk factors using complete history taking and physical examination at the initial visit, and at regular intervals thereafter depending on the risk level	37	26.1	120	84.5	41	28.9
Advise follow-up of patients at regular intervals in rural health units, urban health centers, birthing centers, social hygiene clinics, and other similar health facilities depending on the individual's risk level	36	25.4	123	86.6	41	28.9
Educate patients about supportive therapy for symptomatic relief, including non—pharmacologic interventions and pharmacologic interventions, their right dosing, and their possible side effects/adverse effects.	34	23.9	110	77.5	43	30.3
General survey (inspection)	31	21.8	113	79.6	43	30.3
Vital signs (BP, RR, HR, temperature)	31	21.8	126	88.7	34	23.9
Skin (inspection, palpation)	31	21.8	103	72.5	51	35.9
Perform a complete screening, physical examination in well or asymptomatic adults	30	21.1	96	67.6	39	27.5
Encourage adult patients to ensure that the supply of prescribed medications, especially maintenance medications, is uninterrupted and available at home.	30	21.1	121	85.2	37	26.1
Hypertension: BP measurement using a validated oscillometric BP device with an appropriately-sized upper arm cuff, according to the standard BP measurement protocol	28	19.7	116	81.7	33	23.2
Advise and/or counsel adult patients to: a. Adhere to the treatment regimen b. Observe and immediately report signs and/or symptoms of adverse drug reactions	28	19.7	118	83.1	36	25.4
Encourage adult patients to participate in the development and formulation of psychosocial care or clinical treatment plan and give informed consent before receiving treatment or care, and uphold the right to withdraw such consent	28	19.7	98	69.0	40	28.2
Initiate additional screening appropriate to the patient's condition and the identified risk factors from the history taking and physical examination	25	17.6	95	66.9	34	23.9
Request for additional tests or targeted screening if the risk factors that were identified place an individual at higher risk for developing a specific disease	24	16.9	91	64.1	38	26.8
Head/HEENT (inspection, palpation, auscultation, otoscopy, fundoscopy as needed)	22	15.5	88	62.0	45	31.7
PhilPEN Risk Factor Assessment	22	15.5	95	66.9	35	24.6
Encourage adult patients to designate or appoint a person of legal age to act as their own legal representative, in the event of loss of decision-making capacity	22	15.5	81	57.0	46	32.4
Extremities (inspection, palpation, percussion, auscultation)	21	14.8	77	54.2	47	33.1
Use screening questionnaires/tools and laboratory and imaging tests appropriate to the patient's condition	17	12.0	76	53.5	35	24.6

**uses valid N, takes into account missing entries*

Table 6. Cross Tabulation of Top 20 Tasks Reported as Highly Critical, Not Trained in Pre-service

Top Task (1-20)	high criticality and non-pre-service education		high criticality		in-service		on-the-job		never trained	
	n	%*	n	%*	n	%*	n	%*	n	%*
Acute Chest Pain (suspected acute coronary syndrome): Basic Emergency Assessment, 12-L ECG within 10 minutes of presentation, provided it does not delay transfer to the nearest ED	40	28.2	65	45.8	31	21.8	22	15.5	38	26.8
Offer referral to higher levels if care to patients with signs, symptoms, or concerns needing specialty care and rehabilitation	40	28.2	50	35.2	45	31.7	46	32.4	11	7.7
Refer to higher level facilities for more specialized tests, as necessary and as appropriate for the patient's condition.	38	26.8	58	40.8	44	31.0	46	32.4	9	6.3
Acute Neurologic Symptoms: 1) Basic Emergency Assessment (Airway, Breathing, Circulation, Disability, Exposure); 2) FAST (Face Arm Speech Test) for rapid assessment; 3) Capillary blood glucose to check for hypoglycemia	37	26.1	63	44.4	43	30.3	29	20.4	19	13.4
Stable ischemic heart disease/chronic stable angina pectoris: 12-L ECG	31	21.8	51	35.9	26	18.3	26	18.3	32	22.5
Request diagnostic tests in a rational manner and interpret their results promptly and accurately, particularly when those tests are available at the primary care level, in order to create an accurate clinical impression of the patient's condition and initiate timely and appropriate management	31	21.8	44	31.0	41	28.9	37	26.1	22	15.5
Request diagnostic tests appropriate to the individual's presentation and clinical impression.	30	21.1	38	26.8	40	28.2	26	18.3	17	12.0
Educate patients about supportive therapy for symptomatic relief, including non—pharmacologic interventions and pharmacologic interventions, their right dosing, and their possible side effects/ adverse effects.	30	21.1	44	31.0	41	28.9	41	28.9	9	6.3
Hypertension – uncomplicated: Renin-Angiotensin-Aldosterone System blockers OR Angiotensin-receptor blockers OR calcium channel blockers OR thiazide/ thiazide-like diuretics, singly or in combination	29	20.4	40	28.2	30	21.1	26	18.3	34	23.9
Type 2 diabetes without ASCVD: Metformin for glucose control; moderate intensity statin for primary prevention	29	20.4	39	27.5	30	21.1	28	19.7	39	27.5
Type 2 diabetes with ASCVD: 1st/2nd line drug as mentioned above; high intensity statin therapy for secondary prevention	29	20.4	39	27.5	31	21.8	25	17.6	42	29.6
Coordinate with rehabilitation providers, including rehabilitation medicine specialists, physical, occupational, and speech therapists, within the HCPN, to ensure the seamless transition from specialized to primary care and reintegration into the community of patients	27	19.0	36	25.4	34	23.9	40	28.2	25	17.6

Table 6. Cross Tabulation of Top 20 Tasks Reported as Highly Critical, Not Trained in Pre-service *(continued)*

Top Task (1-20)	high criticality and non-pre-service education		high criticality		in-service		on-the-job		never trained	
	n	%*	n	%*	n	%*	n	%*	n	%*
Encourage adult patients to ensure that the supply of prescribed medications, especially maintenance medications, is uninterrupted and available at home.	26	18.3	45	31.7	50	35.2	44	31.0	1	0.7
CVD Risk Screening and Assessment Tool (WHO) and ASCVD Risk Calculator	25	17.6	28	19.7	35	24.6	31	21.8	46	32.4
Dyslipidemia: lipid profile	25	17.6	33	23.2	30	21.1	22	15.5	39	27.5
Prescribe medications appropriate to the individual's presentation and the clinical impression.	25	17.6	37	26.1	27	19.0	23	16.2	32	22.5
Incorporate the principles of palliative care in primary care management, by preventing and relieving the most common and severe types of suffering associated with serious or complex health problems.	24	16.9	34	23.9	47	33.1	37	26.1	18	12.7
PhilPEN Risk Factor Assessment	23	16.2	28	19.7	48	33.8	53	37.3	11	7.7
Offer palliative care measures such as but not limited to: a. Medications that help relieve specific symptoms or types of suffering b. Non-pharmacologic interventions to help alleviate suffering and improve quality of life	23	16.2	33	23.2	45	31.7	40	28.2	18	12.7
Screen asymptomatic adults 20 years old and above for risk factors using complete history taking and physical examination at the initial visit, and at regular intervals thereafter depending on the risk level	22	15.5	35	24.6	39	27.5	39	27.5	2	1.4

**uses valid N, takes into account missing entries*

Table 7. Cross Tabulation for Top 20 Tasks Rated as High Criticality, Low Perceived Competence

Top Task (1-20, with ties)	high criticality and low perceived competence		high criticality		low perceived competence	
	n	% *	n	% *	n	% *
Acute Neurologic Symptoms: 1) Basic Emergency Assessment (Airway, Breathing, Circulation, Disability, Exposure); 2) FAST (Face Arm Speech Test) for rapid assessment; 3) Capillary blood glucose to check for hypoglycemia	37	26.1	63	44.4	90	63.4
Acute Chest Pain (suspected acute coronary syndrome): Basic Emergency Assessment, 12-L ECG within 10 minutes of presentation, provided it does not delay transfer to the nearest ED	31	21.8	65	45.8	66	46.5
Refer to higher level facilities for more specialized tests, as necessary and as appropriate for the patient's condition.	28	19.7	58	40.8	84	59.2
Offer referral to higher levels if care to patients with signs, symptoms, or concerns needing specialty care and rehabilitation	27	19.0	50	35.2	90	63.4
Encourage adult patients to ensure that the supply of prescribed medications, especially maintenance medications, is uninterrupted and available at home.	25	17.6	45	31.7	96	67.6
Perform comprehensive history taking, including the history of present illness, past medical history, family history, personal, social, and occupational history	24	16.9	38	26.8	79	55.6
Request for additional tests or targeted screening if the risk factors that were identified place an individual at higher risk for developing a specific disease	24	16.9	37	26.1	86	60.6

Table 7. Cross Tabulation for Top 20 Tasks Rated as High Criticality, Low Perceived Competence *(continued)*

Top Task (1-20, with ties)	high criticality and low perceived competence		high criticality		low perceived competence	
	n	% *	n	% *	n	% *
Advise follow-up of patients at regular intervals in rural health units, urban health centers, birthing centers, social hygiene clinics, and other similar health facilities depending on the individual's risk level	24	16.9	36	25.4	87	61.3
Educate patients about supportive therapy for symptomatic relief, including non—pharmacologic interventions and pharmacologic interventions, their right dosing, and their possible side effects/adverse effects.	24	16.9	44	31.0	93	65.5
Incorporate the principles of palliative care in primary care management, by preventing and relieving the most common and severe types of suffering associated with serious or complex health problems.	24	16.9	34	23.9	105	73.9
Advise and/or counsel adult patients to: a. Adhere to the treatment regimen b. Observe and immediately report signs and/or symptoms of adverse drug reactions	24	16.9	40	28.2	98	69.0
Offer palliative care measures such as but not limited to: a. Medications that help relieve specific symptoms or types of suffering b. Non-pharmacologic interventions to help alleviate suffering and improve quality of life	22	15.5	33	23.2	104	73.2
Stable ischemic heart disease/chronic stable angina pectoris: 12-L ECG	21	14.8	51	35.9	67	47.2
Screen asymptomatic adults 20 years old and above for risk factors using complete history taking and physical examination at the initial visit, and at regular intervals thereafter depending on the risk level	20	14.1	35	24.6	84	59.2
Request diagnostic tests appropriate to the individual's presentation and clinical impression.	20	14.1	38	26.8	67	47.2
Hypertension: BP measurement using a validated oscillometric BP device with an appropriately-sized upper arm cuff, according to the standard BP measurement protocol	20	14.1	53	37.3	67	47.2
Request diagnostic tests in a rational manner and interpret their results promptly and accurately, particularly when those tests are available at the primary care level, in order to create an accurate clinical impression of the patient's condition and initiate timely and appropriate management	20	14.1	44	31.0	74	52.1
Initiate additional screening appropriate to the patient's condition and the identified risk factors from the history taking and physical examination	19	13.4	31	21.8	87	61.3
Observe proper legal procedures in securing advanced directives.	19	13.4	31	21.8	84	59.2
Coordinate with rehabilitation providers, including rehabilitation medicine specialists, physical, occupational, and speech therapists, within the HCPN, to ensure the seamless transition from specialized to primary care and reintegration into the community of patients.	18	12.7	36	25.4	82	57.7
Coordinate with the LGU, community support groups, or partner/advocacy organizations regarding the provision of basic needs, in-kind support, psychosocial support, and spiritual support to patients.	18	12.7	28	19.7	101	71.1

**uses valid N, takes into account missing entries*

For NCDs, in particular, some of the screening tasks are delegated to nurses who are usually the health personnel deployed to barangay (village) health stations. Many other NCD-related tasks – such as health education, medication dispensing, basic diagnostic testing, and risk assessment – are being shifted to nurses in the integrated management of hypertension and diabetes mellitus as also reported in other studies.[11] These activities are regarded as routine clinic tasks that are performed frequently by both nurses and doctors, most especially during their first contact with patients. Given this, it appears that task sharing is also practiced in Benguet.

The observed trend of delegating screening and other NCD-related tasks to nurses, especially at barangay health stations, aligns with global strategies aimed at optimizing healthcare delivery, especially in regions with physician shortages.[11] These delegated tasks, often the first point of contact for patients, underscore the pivotal role nurses play in initial patient assessments, as well as in ensuring continuity of care.[25] While this task sharing mirrors global approaches, especially in regions striving for cost-effective healthcare delivery,[11,26] nuances may exist based on local needs, cultural contexts, and disease prevalence. For Benguet, this strategy

not only indicates a proactive approach to tackling healthcare challenges, particularly around NCDs but also emphasizes the province's immediate need to bridge healthcare service gaps. This trend underscores the importance of continuous training for nurses and also highlights a broader, long-term strategy that should encompass the recruitment of more healthcare workers, infrastructure development, and policy adjustments to holistically address the province's healthcare demands.[15]

Other studies reported that nurses have demonstrated their ability to adhere to clinical practice guidelines or protocols.[9,27] While this was not intentionally observed in this study, many participants reported having been trained on the PhilPEN protocol and have expressed that they are competent to perform these tasks. This adherence not only promises consistent and high-quality patient care but also paves the way for a more efficient healthcare delivery system. Aside from this, the promulgation of the DOH Omnibus Health Guidelines for Adults has promoted the performance of early screening, accurate diagnosis, and effective management of frequent diseases and conditions in adults which may explain the high frequency of implementation of some of these tasks as reported by the participants. Such empowerment and extended roles for nurses have been observed to lead to increased job satisfaction and professional growth.[28]

In terms of patient outcomes and public health implications, health workers should be educated first and foremost on how to adequately handle critical concerns. For instance, prescribing medications should take precedence over writing reports. Such prioritization will assist in ensuring that nurses possess the abilities that will have the greatest favorable effect on health outcomes. Because low-frequency tasks are less likely to be mastered in a regular working setting, training is more important for obtaining and sustaining competence in these activities. When developing education and training plans, it is important to prioritize tasks that were apparently performed infrequently but were critical. One example would be highly critical tasks that, if done incorrectly or not at all, could result in high rates of morbidity and mortality. As might be predicted, emergency-related actions like diagnostic tests for neurologic and cardiovascular disorders are rarely carried out yet are nonetheless considered to be of high importance.

During curriculum review, tasks that participants reported were highly critical but for which they claimed to never have received training should be carefully taken into account. The same is true for tasks that are of a high level of importance but are not included in pre-service training. Many of the tasks in this category (high criticality and never trained or trained on-the-job/pre-service) involve diagnostic tests for critical health conditions and medications for hypertension and diabetes. These should be considered when revising education and training curricula. It is important to note, however, that many of these tasks are supposedly not within the scope of practice of nurses at the moment.

Focus and attention are necessary for both practicing nurses and nursing students who are about to deploy when executing tasks that are considered as being highly critical but for which they have a low level of self-perceived competence. As indicated above, highly critical tasks that participants perceive as having low competence still involve diagnostic tests and screening for emergency conditions as well as hypertension and diabetes. Thus, health workers performing these tasks in public health centers should be offered routine updates.

Strength and Limitations

The study setting was limited to Benguet province where many of its barangays are considered geographically isolated and disadvantaged areas. While the choice of setting may affect the generalizability of the findings, this study has the potential to provide an explanatory direction to certain settings with the same context. Other settings may have unique factors and challenges that influence the applicability of the study's recommendations.

The task analysis methodology is not an accurate measure of actual clinical performance as it relies on self-reporting by participants. Because of this, there may be under- or over-reporting due to inaccurate memory and bias toward social desirability.[18,19]

Comprehensive task analysis may be done to understand bottlenecks and identify tasks that are provided by various healthcare cadres, especially those that do not match the official scope of work, regulatory policies, and education and training.

CONCLUSION

The primary care practice in Benguet typically involves tasks that are centered on health promotion or disease prevention. We found that many of the tasks are shared by doctors and nurses, with some highly critical tasks performed less frequently due to a lack of training. This presents an opportunity to promote task shifting as an appropriate strategy in settings where there is a surplus of health workers with the right skills to deliver the right services based on healthcare demands. Health professions education curricula and professional scopes of practice should be revisited and revised when considering task shifting. A national policy or framework on task shifting should be developed to guide its implementation, monitoring, and evaluation.

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REFERENCES

1. Ulep VG, Uy J, Casas LD. Primary Health Care for Non-communicable Diseases in the Philippines [Internet]. 2020 [cited 2022 Aug 27]. Available from: https://pidswebs.pids.gov.ph/CDN/PUBLICATIONS/pidsdps2039.pdf
2. NCD Alliance. PROTECTING POPULATIONS, PRESERVING FUTURES: Optimising the Health Workforce to Combat NCDs and Achieve UHC [Internet]. 2019 [cited 2023 Sep1]. Available from: https://ncdalliance.org/sites/default/files/resource_files/ProtectingPopulationsPreservingFutures_FINAL_23Sept.pdf
3. Bonito SR, Balabagno AO, Pagsibigan JS, Sereneo KAC. Nursing workforce in the Philippines: Data and issues. Philipp J Nurs. 2019 Jan-Jun;89(1):3-15.
4. Department of Health. Philippine Health Facility Development Plan 2020-2040 [Internet]. 2020 [cited 2022 Oct 7]. Available from: https://doh.gov.ph/sites/default/files/publications/DOH_PHILIPPINE%20HEALTH%20FACILITY%20DEVELOPMENT%20PLAN%202020_2040_0.pdf
5. Dayrit MM, Lagrada LP, Picazo OF, Pons MC, Villaverde MC. the philippines health system review. Health Systems in Transition. 2018;8(2).
6. Philippine Statistics Authority. Registered Deaths in the Philippines, 2020 [Internet]. 2022 [cited 2022 Jul 7]. Available from: https://psa.gov.ph/vital-statistics/id/165879
7. Department of Health. Magna Carta of Public Health Workers (R.A. 7305) Revised Implementing Rules and Regulations [Internet]. [cited 2023 Sep 1]. Available from: https://elibrary.judiciary.gov.ph/thebookshelf/showdocs/11/50646
8. Iwelunmor J, Onakomaiya D, Gyamfi J, Nyame S, Apusiga K, Adjei K, et al. Adopting task-shifting strategies for hypertension control in Ghana: Insights from a realist synthesis of stakeholder perceptions. Glob Heart. 2019 Jun;14(2):119-27. doi:10.1016/j.gheart.2019.05.007. PMID: 31324365
9. Gyamfi J, Plange-Rhule J, Iwelunmor J, Lee D, Blackstone SR, Mitchell A, et al. Training nurses in task-shifting strategies for the management and control of hypertension in Ghana: a mixed-methods study. BMC Health Serv Res. 2017 Feb 2;17(1):104. doi:10.1186/s12913-017-2026-5. PMID: 28148255; PMCID: PMC5288999.
10. Ogedegbe G, Gyamfi J, Plange-Rhule J, Surkis A, Rosenthal DM, Airhihenbuwa C, et al. Task shifting interventions for cardiovascular risk reduction in low-income and middle-income countries: a systematic review of randomised controlled trials. BMJ Open. 2014 Oct 16;4(10):e005983. doi:10.1136/bmjopen-2014-005983. PMID: 25324324; PMCID: PMC4202019.
11. Joshi R, Alim M, Kengne AP, Jan S, Maulik PK, Peiris D, et al. Task shifting for non-communicable disease management in low and middle income countries--a systematic review. PloS One. 2014 Aug 14;9(8):e103754. doi:10.1371/journal.pone.0103754. PMID: 25121789; PMCID: PMC4133198.
12. World Health Organization. Task Shifting- Global Recommendations & Guidelines [Internet]. 2008 [cited 2023 Sep1]. Available from: https://apps.who.int/iris/bitstream/handle/10665/43821/9789?sequence=1
13. Dawson AJ, Buchan J, Duffield C, Homer CSE, Wijewardena K. Task shifting and sharing in maternal and reproductive health in low-income countries: a narrative synthesis of current evidence. Health Policy Plan. 2014 May;29(3):396-408. doi:10.1093/heapol/czt026. PMID: 23656700.
14. Fulton BD, Scheffler RM, Sparkes SP, Auh EY, Vujicic M, Soucat A. Health workforce skill mix and task shifting in low income countries: a review of recent evidence. Hum Resour Health. 2011 Jan 11;9:1. doi:10.1186/1478-4491-9-1. PMID: 21223546; PMCID: PMC3027093.
15. Aytona MG, Politico MR, McManus L, Ronquillo K, Okech M. Determining staffing standards for primary care services using workload indicators of staffing needs in the Philippines. Hum Resour Health. 2022 Jan 28;19(Suppl 1):129. doi:10.1186/s12960-021-00670-4. PMID: 35090487; PMCID: PMC8796386.
16. Tolsma M, Emeis C, McFarlin B, Schmiege S. 2012 Task Analysis: A Report of Midwifery Practice. American Midwifery Certification Board [Internet]. 2012 [cited 2023 Sep 1]. Available from: https://www.amcbmidwife.org/docs/default-source/task-analysis/2012-task-analysis-report.pdf?sfvrsn=e98edff4_2
17. Dgedge M, Mendoza A, Necochea E, Bossemeyer D, Rajabo M, Fullerton J. Assessment of the nursing skill mix in Mozambique using a task analysis methodology. Hum Resour Health. 2014 Jan 25;12:5. doi:10.1186/1478-4491-12-5 PMID: 24460789; PMCID: PMC3900508.
18. Udaya A, Subah M, Drake M, Ng C, Johnson P. Task analysis: An evidence-based methodology for strengthening education and training of nurses and midwives in Liberia. Int J Nurs Midwifery. 2011;3(9):118-27. doi:10.5897/IJNM.9000041.
19. Hart L, Subah M, Drake M, Ng C, Johnson P. Linking Licensure Examinations to Nursing Practice through Task Analysis: A Case for Botswana. Jhpiego Corporation [Internet]. 2014 [cited 2023 Jun 22]. Available from: http://reprolineplus.org/system/files/resources/FINAL_Botswana_Nurse_Licensure_Study_Report_0.pdf.
20. van Weel C, Kidd MR. Why strengthening primary health care is essential to achieving universal health coverage. CMAJ. 2018 Apr 16;190(15):E463-E466. doi:10.1503/cmaj.170784. PMID: 29661815; PMCID: PMC5903888.
21. Hart LJ, Carr C, Fullerton JT. Task analysis as a resource for strengthening health systems. J Midwifery Womens Health. 2016 Mar-Apr;61(2):257-62. doi:10.1111/jmwh.12410. PMID: 26849402.
22. Department of Health. Administrative Order No. 2020-0040 Guidelines on the Classification of Individual-based and Population-based Primary Care Service Packages [Internet]. September 7, 2020 [cited 2022 Oct7]. Available from: https://doh.gov.ph/sites/default/files/policies_and_laws/C.3%20AO%202020-0040%20Classification%20of%20Individual-based%20and%20Population-based%20Primary%20Care%20Service%20Packages.pdf
23. Department of Health. Administrative Order No. 2020-0038 Guidelines on the Deployment of Human Resources for Health under the National Health Workforce Support System [Internet]. 2020 [cited 2023 Jun 20]. Available from: https://dmas.doh.gov.ph:8083/Rest/GetFile?id=656754
24. Department of Health. OMNIBUS HEALTH GUIDELINES FOR ADULTS [Internet]. 2002 [cited 2022 Nov25]. Available from: https://doh.gov.ph/dpcb/omnibus-health-guidelines
25. Khatri R, Endalamaw A, Erku D, Wolka E, Nigatu F, Zewdie A, et al. Continuity and care coordination of primary health care: a scoping review. BMC Health Serv Res. 2023 Jul 13;23(1):750. Doi:10.1186/s12913-023-09718-8. PMID: 37443006; PMCID: PMC10339603.
26. Seidman G, Atun R. Does task shifting yield cost savings and improve efficiency for health systems? A systematic review of evidence from low-income and middle-income countries. Hum Resour Health. 2017 Apr 13;15(1):29. doi:10.1186/s12960-017-0200-9. PMID: 28407810; PMCID: PMC5390445.
27. Some D, Edwards JK, Reid T, Van den Bergh R, Kosgei RJ, Wilkinson E, et al. Task shifting the management of non-communicable diseases to nurses in Kibera, Kenya: Does it work? PLoS One. 2016 Jan 26;11(1):e0145634. doi:10.1371/journal.pone.0145634. PMID: 26812079; PMCID: PMC4727908.
28. Karimi-Shahanjarini A, Shakibazadeh E, Rashidian A, Hajimiri K, Glenton C, Noyes J, et al. Barriers and facilitators to the implementation of doctor-nurse substitution strategies in primary care: a qualitative evidence synthesis. Cochrane Database Syst Rev. 2019 Apr 15;4(4):CD010412. doi:10.1002/14651858.CD010412.pub2. PMID: 30982950; PMCID: PMC6462850.