



The Open Public Health Journal

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RESEARCH ARTICLE

Factors Influencing the Retention of Midwives in Rural Areas of Bhutan: A National Cross-sectional Study

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Abstract:

Background:

The retention of midwives in rural areas is pivotal in achieving sustainable development goals, particularly those concerning maternal and child health. Though the human resource planning policy mandates at least one midwife in every primary healthcare facility (PHCF), Bhutan has not achieved this target.

Objective:

This study has aimed to explore the factors that influence the retention of midwives in rural areas of Bhutan.

Methods:

A national cross-sectional study was conducted in 2022 among all 165 midwives working in rural PHCFs across 20 districts in Bhutan. The questionnaire was designed based on the World Health Organization framework that was developed for rural health workforce retention. Data were collected online using a structured closed-ended self-administered questionnaire and were then analysed using descriptive statistics and linear regression.

Results:

The analysis revealed that the midwives had a high retention intention. Age, monthly income, work experience, personal origins and values, family and community aspects, working and living conditions, career-related opportunities, financial incentives, and mandatory service were positively and statistically significantly correlated with retention. Financial incentives and working and living conditions were the predictors that strongly influenced the retention of midwives in rural areas.

Conclusion:

This study indicated that the retention of midwives was high and was influenced by multiple factors. Financial incentives and working and living conditions were highly significant factors in attracting and retaining midwives in rural PHCFs.

Keywords: Employee retention, Human resources for health, Health workforce, Intention to stay, Midwives, Primary health care, Primary healthcare facility, Rural health.

Article History

Received: May 21, 2023

Revised: July 23, 2023

Accepted: July 31, 2023

1. INTRODUCTION

Midwives play a crucial role in enhancing health and reducing the mortality of maternal and child health (MCH). The analysis of 88 countries in low- and middle-income countries (LMICs) demonstrated that the availability and coverage of midwives could prevent 67% of maternal deaths,

64% of neonatal deaths, and 65% of stillbirths [1]. However, the issue of poor retention is exacerbated by ineffective retention policies [2, 3]. These concerns are overwhelmingly pervasive within LMICs [1]. The rural retention of midwives has now garnered the attention of global policymakers [4, 5].

In Bhutan, female health assistant (FHA) plays a significant role in the health of rural mothers and children, as 62.2% of the female population in Bhutan resides in rural areas [6]. FHAs are required to earn an entry qualification in class 12

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science, with a formal three-year Diploma in Community Health [3]. They are deployed in primary healthcare facilities (PHCFs) and in urban health facilities where the PHCFs are in rural and remote places. The current standard of the Ministry of Health (MoH) mandates at least two HAs, including one FHA per team in each PHCF [3]. FHAs were previously known as auxiliary nurse midwives. Their main responsibility is to provide MCH services, which is comparable to the cadre of professional midwives and PHC nurses [3, 7]. Thus, the terms “midwives” and “FHAs” are used interchangeably in this study.

While nearly half of the world’s population lives in rural regions, a large proportion of human resources for Health (HRH) primarily serve urban populations [8]. For instance, In Indonesia, more than half of urban villages have three or more midwives, compared to less than three percent of rural and remote villages [9]. In Bhutan, although the standard mandates one midwife in every PHCF [3], the administrative data indicates that 21.1% of PHCFs function without a midwife, while the urban health facilities employ 92% more than the required standard [10]. The Royal Government of Bhutan (RGoB) has prioritized the retention of midwives in rural areas. Interventions are broadly categorized as forms of financial compensation, such as rural allowance, high-altitude allowance, and travel allowance; types of non-financial support include personal, educational, and professional development systems, as well as mandatory rural services [3]. However, since most midwives prefer working in urban health facilities [3], retaining them in rural areas has been a perennial concern for the RGoB [11].

The literature suggests that the factors influencing the rural retention of HRH are complex. The factors influencing the retention of midwives include professional and educational development, the work environment, career-related opportunities, mandatory service policies, financial support, and individual factors (age, marital status, work experience, monthly income) [5, 12 - 16]. These factors are consistent with the World Health Organization’s (WHO) conceptual framework [17], which details the factors that influence retention (or intention to stay) among the healthcare workforce in rural areas, as developed by Henderson and Tulloh [18]. Although some studies have documented the rural retention of female primary healthcare workforces in other regions [14, 15, 19, 20], only limited published studies have concerned professional midwives, among which only a few publications have addressed Asian countries [5, 16].

In Bhutan, the human resource planning policy highlights the need for the recognition of midwives for their critical role in promoting healthy pregnancies and childbirth. Nevertheless, the shortage of midwives in rural areas remains a significant concern that must be addressed [21]. Therefore, this study aimed to explore the factors that influence the retention of midwives in rural areas of Bhutan. Findings from this study are expected to aid RGoB in evidence-based planning to improve the retention of midwives in rural areas.

2. MATERIALS AND METHODS

2.1. Study Design and Study Population

A national cross-sectional survey was conducted with 165

midwives who were working in PHCFs across 20 districts in Bhutan. The G*power program was used to calculate the number of participants. To ensure adequate data quality for multiple regression, a power value of 0.90, an effect size value of 0.15, and an alpha value of 0.05 were considered [22]. Based on the number of 12 independent variables, the G*power software suggested a sample size of 157. However, due to the size of the study population, we included all 165 registered midwives as study participants.

The inclusion criteria for the participating midwives were as follows: being assigned to PHCFs, being at least 20 years old, not suffering from a mental disorder, having access to internet facilities, and being willing to participate in the study. Midwives who had been at a PHCF for less than six months or who intended to resign within the next six months were excluded. All 165 midwives were eligible to participate in the study.

2.2. Assessment Instruments and Criteria

The data collection instrument was adopted following a thorough analysis of the literature relevant to the study’s objective. The questionnaire was comprised of three parts. Parts two and three were developed in line with the preceding WHO framework [17]. Part one consisted of six items designed to obtain socio-demographic characteristics.

Part two consisted of six sections, and a survey instrument was adopted from the literature review related to rural health workforce retention [5, 13 - 15, 20, 23 - 25]. Section one of part two focused on personal origins and values, consisting of two domains (personal origins; and values and altruism) and seven items. Section two, which focused on family and community aspects, comprised three domains (sense of community spirit, family conditions, and community facilities) and 12 items. Section three evaluated the participants’ working and living conditions. It comprised four domains (work environment, technology and medical supplies, accommodations, and Work-related stress) and 15 items. Section four assessed career-related opportunities, encompassing five domains (continuing education opportunities, professional development courses, managerial support, recognition systems, and job satisfaction) and 15 items. Section five measured financial incentives and included two domains (salary and allowance) and seven items. Section six collected data regarding mandatory service and consisted of four items.

Part three evaluated retention, and its scale contained four items adapted from the literature [26, 27]. The term “retention” in this study refers to the midwives’ expressed intentions to stay and their preference for continuing to work in PHCFs in rural areas. [28].

Parts two and three were measured using a five-point Likert scale ranging from one to five (strongly disagree to strongly agree). Five scale mean scores were then categorized into two interval scales with the cut-off point set at three [29]. For instance, it was interpreted as indicating favorable working and living conditions if the mean score was higher than three, and it was interpreted as unfavorable if the mean scores were equal to or less than three. Similarly, a mean score of more

than three for retention indicated a high retention intention *vis-à-vis* a mean score equal to or below three.

The content validity of the questionnaire was assessed by consulting three experts [30]. Two of them were academics with experience in HRH research, and one was a policymaker with experience working with midwives. The questionnaire's content validity was evaluated by computing item-objective congruence (IOC) values, which ranged from 0.67 to 1.00. Following the experts' agreement, a pilot study was conducted to assess the questionnaire's reliability. The questionnaire was tested with a group of 30 midwives who are presently employed in urban health facilities but had previously worked at PHCFs in rural areas. Consequently, these 30 midwives were excluded from the main study's original survey. The Cronbach's alpha of the scales was 0.770 for personal origins and values, 0.710 for family and community aspects, 0.794 for working and living conditions, 0.806 for career-related opportunities, 0.754 for financial incentives, 0.771 for mandatory service, and 0.811 for retention.

2.3. Data Collection

The data collection process was initiated in May 2022 by contacting the respective District Health Officers (DHOs) to seek their assistance. The DHOs were informed about the study's objectives and provided guidance on conducting the questionnaire collection. Data were gathered from the entire population of 165 midwives working in all 20 PHCFs located within the rural area of Bhutan. Data were collected through a structured, closed-ended, self-administered questionnaire that was shared with the participants individually *via* email, Telegram, and Messenger. This method was selected as the first option due to the circumstances involving the COVID-19 pandemic. Online surveys protect respondents' anonymity, allowing them to react honestly without the fear of being identified [31]. The DHOs were asked to remind the participants every two weeks and follow up with the non-respondents. Additionally, to ensure that the participants did not provide duplicate responses, they were informed in the consent form that they should complete the survey only once. They were also required to use unique email IDs to log in and complete the survey. During data cleaning process, any duplicate response questionnaire associated with participants using duplicated email IDs was removed. The data collection process was completed in July 2022, with a response rate of 100%.

2.4. Data Analysis

The data analysis was performed using IBM SPSS software (Version 22) [32]. Descriptive statistics, comprising

frequencies, percentages, mean, and standard deviations, were employed to present the characteristics of each variable in this study. Inferential statistics, specifically bivariate and multivariate linear regression analyses, were utilized to examine the correlations and predictive relationships among the 12 independent variables (age, monthly income, marital status, number of years in service, duration at the current workplace, work experience in rural areas, personal origins and values, family and community aspects, working and living conditions, career-related opportunities, financial incentives, and mandatory service) and the dependent variable (retention). All variables, with the exception of the marital status variable, were measured on a continuous scale. Consequently, to perform the linear regression analysis, the marital status variable, which was measured on a discrete scale, was converted into a dummy variable [33]. Statistical significance was accepted at a significance value of <0.05.

Before the analysis of the linear regression, its assumptions were tested [33]. The normality of the residuals was assessed using a probability plot (P-P plot), which revealed no significant deviations from normality, which is represented by a straight line. Additionally, the mean and standard deviation of the standardized residuals were 0 and 0.994, respectively, indicating the normality of the residuals. The scattered plot pattern of the data showed a symmetrical distribution, indicating no homoscedasticity within the residuals. The tolerance values were more than 0.2, and the tolerance and variance inflation factor (VIF) values were less than 10.0, suggesting no multicollinearity between the independent variables. The Durbin-Watson value was 1.987, which falls within the range of 1.50 to 2.50, implying no auto-correlation of the residuals. After all the assumptions had been met [33], a multiple linear regression analysis with the stepwise method was performed to explore predictors of retention among rural midwives. The stepwise method is an "automated" approach to model building, aiming to maximize predictive accuracy [33]. This method is well-suited for exploring the extensive number of potential predictors and offers flexibility in analysing the final set of variables included in "a prediction equation" [34].

3. RESULTS

The analysis revealed that 48.5% of the participants were aged ≤ 30 years, with a mean age of 32.92 ± 8.15. The average monthly income was Nu. 27,094±5,648 (approximately US\$ 348.02). Nearly three-quarters (72.1%) of the participants (62.5%) were in service between one half and 10 years. On average, their duration at their current workplace and their rural work experience were 4.53±3.94 years and 8.30±7.32 years, respectively. These findings are presented in Table 1.

Table 1. Socio-demographic characteristics of midwives.

Variables (N=165)	Items	N	%	Mean ± Standard Deviation
Age	≤30 years	80	48.5	-
	31-40 years	52	31.5	
	≥41 years	33	20.0	
	Total	165	100.0	32.92±8.15

(Table 3) contd....

Variables (N=165)	Items	N	%	Mean ± Standard Deviation
Monthly income (Nu [†])	≤25,000	92	55.8	-
	25,001-35,000	55	33.3	
	≥35,001	18	10.9	
	Total	165	100.0	27,094±5,648
Marital status	Married	119	72.1	-
	Single, widowed, divorced, or separated	46	27.9	
	Total	165	100.0	-
Number of years in service	6 months to 5 years	61	37.0	-
	6-10 years	42	25.5	
	11-20 years	33	20.0	
	≥21 years	29	17.5	
	Total	165	100.0	10.3±8.90
Duration at the current workplace	≤3 years	84	50.9	-
	4-10 years	67	40.6	
	≥11 years	14	8.5	
	Total	165	100.0	4.53±3.94
Work experience in rural areas	≤10 years	119	72.1	-
	≥11 years	46	27.9	
	Total	165	100.0	8.30 ±7.32

Note: [†]Ngultrum, where Nu. 77.85=US\$1.

Table 2. General characteristics and the retention of midwives.

Variables (N=165)	Domains	Mean ± Standard Deviation
Personal origins and values	Values and altruism	4.24±0.61
	Place of origins	3.14±1.15
	Total Domain	3.77±0.68
Family and community aspect	Sense of community spirit	4.31±0.60
	Family conditions	4.05±0.79
	Community facilities	2.56±0.91
	Total Domain	3.51±0.55
Working and living conditions	Working environment	4.16±0.60
	Technology and medical supplies	3.66±0.72
	Accommodations	4.00±1.00
	Work-related stress	2.92±0.84
	Total Domain	3.83±0.53
Career-related opportunities	Continuing education opportunities	3.54±0.87
	Professional development courses	3.66±0.75
	Managerial support	3.56±0.83
	Recognition systems	3.69±0.75
	Job satisfaction	3.48±1.06
	Total Domain	3.61±0.59
Financial incentives	Salary	3.59±0.71
	Allowance and benefits	3.43±0.92
	Total Domain	3.52±0.74
Mandatory services	Total Domain	3.46±0.82
Retention	Total Domain	3.52±0.92

Table 2 illustrates the mean scores for all the domains. Among the domains, the highest mean score reported by the participants was for a sense of community spirit (4.31±0.60). The lowest mean scores were for work-related stress

(2.92±0.84) and community facilities (2.56±0.91). Only these two domains had mean scores lower than the 3.00 cut-off point. Overall, participants indicated a high intention to stay (3.52±0.92).

Table 3. The correlation of independent variables and the retention of midwives.

Variables (N=165)	b	95% CI for b	β	t	P
Age	0.088	0.020-0.157	0.196	2.550	0.012*
Monthly income	0.0002	0.000054- 0.000250	0.234	3.067	0.003*
Married (reference group = Single, widowed, divorced, or separated)	-0.072	-1.334-1.191	-0.009	-0.112	0.911
Number of years in service	0.091	0.029-0.154	0.221	2.897	0.004*
Duration at the current workstation	0.129	-0.014-0.271	0.138	1.783	0.077
Rural work experience	0.057	-0.020-0.134	0.113	1.450	0.149
Personal origins and values	0.251	0.139-0.364	0.326	4.397	<0.001*
Family and community aspects	0.172	0.090-0.254	0.308	4.129	<0.001*
Working and living conditions	0.181	0.115-0.247	0.388	5.383	<0.001*
Career-related opportunities	0.152	0.092-0.212	0.364	4.987	<0.001*
Financial incentives	0.303	0.203-0.402	0.426	6.012	<0.001*
Mandatory service	0.254	0.085-0.424	0.226	2.966	0.003*

Note: b = unstandardized coefficient; β = standardized coefficient; CI = confidence interval.

*significant values < 0.05, tested by simple linear regression analysis.

Table 4. Multiple regression analysis of the retention of midwives.

Variables (N=165)	b	95% CI for b	β	t	P
Financial incentives	0.215	0.096-0.334	0.303	3.517	<0.001*
Working and living conditions	0.100	0.022-0.178	0.216	2.542	0.012*
Constant (3.007), R ² = 0.213, Adjusted R ² =0.203, F = 21.906, P<0.001*					

Note: b = unstandardized coefficient; β = standardized coefficient; CI = confidence interval.

*significant values < 0.05, tested by multiple linear regression analysis.

Table 3 revealed that age ($P=0.012$), average monthly income ($P=0.0002$), number of years in service ($P=0.004$), personal origins and values ($P<0.001$), family and community aspects ($P<0.001$), working and living conditions ($P<0.001$), career-related opportunities ($P<0.001$), financial aspects ($P<0.001$), and bonding or mandatory service ($P<0.001$) were positively and significantly correlated with the retention of midwives in rural areas.

The multiple linear regression analysis revealed that variables influencing the retention of midwives were financial incentives ($P<0.001$) and working and living conditions ($P=0.012$). In other words, increased financial incentives and improved working and living conditions contributed to increased retention. The explanatory power (Adjusted R²) for the retention of midwives in rural areas via financial incentives and working and living conditions was 20.3%. The unstandardized regression equation was: retention of midwives = 3.007 + 0.215 (financial incentives) + 0.100 (working and living conditions). These findings are presented in Table 4.

4. DISCUSSION

This was the first study in Bhutan to explore the factors that influence the retention of midwives in rural areas using the WHO retention framework [17]. The current study suggests that the overall retention intention among the participants was relatively high. As part of the retention strategies, midwives in PHCFs in Bhutan are provided with various benefits, such as free accommodations, rural allowances, high-altitude allowances, and travel allowances, as well as training and career development opportunities [3]. This finding is comparable to a study conducted with nurse-midwives in

Malawi [35].

Age and number of years in service were positively correlated with the retention intention among rural midwives in Bhutan. This suggests that midwives who are older and who have been in service for a longer period are more likely to have retention intentions. A younger health workforce usually intends to move to urban areas to pursue career ambitions, enhanced amenities, and family obligations [13, 14]. Therefore, it is necessary to investigate the retention strategies related to young midwives in rural areas.

Personal origins and values, career-related opportunities aspects, family and community aspects, and mandatory service domains were all positively significantly correlated with retention. However, participants reported having poor community facilities (2.56±0.91). This finding was not surprising, given that all PHCFs in Bhutan are in remote areas and lack proper transportation facilities, decent schools, and a proper marketplace. The literature supports this as a plausible deterrent to retention [3]. This finding was consistent with previous reports [3, 14], which suggested that enabling community facilities significantly influences the decisions of health workers to stay in or leave rural places. Consequently, considering the poor scores on community facilities, it is of paramount importance for the government to prioritize the equitable development of basic amenities, such as improved transportation and communication facilities, and schools, among others, to attract and retain the rural health workforce.

Midwives reported having adequate financial incentives (3.52±0.74), which were positively and significantly correlated with retention. Aside from their salaries, midwives in Bhutan are entitled to professional allowances, house rent allowances,

and travel and daily allowances. Furthermore, they are also provided with rural allowances and high-altitude allowances. Due to the nature of their job, on average, rural midwives enjoy a fair number of financial incentives [3]. A study among the rural health workforce in Kenya discovered that increased financial incentives help to pay off loans and send children to decent schools [25]. It is therefore, imperative to ensure the sustenance of the existing financial incentives to enhance the retention of midwives in rural areas of Bhutan. To further improve midwives' retention, the government could explore additional financial incentives, such as extra salary supplements, retention bonuses, and grants for education and training.

The working and living conditions were favourable (3.83 ± 0.53) and were positively and significantly correlated with retention. The evidence suggests that a wide range of determinants, such as the work environment, medical technology, medical supplies, and accommodations, influence midwives' willingness to stay in rural areas. In Bhutan, rural midwives are provided free accommodations. This could be a major incentive to work in rural areas, given that there is a major housing shortage and given the exorbitant house rents in urban areas [3]. By law, in Bhutan, PHCFs must maintain the availability of essential drugs and other consumables at more than 95% throughout the year [21]. This may be another important factor in the retention of midwives in rural areas, as a study in Cameroon suggested that health workers avoided remote places due to a shortage of medicines and medical equipment [36]. The study's results demonstrate that retention among midwives can be improved when midwives perceive that their circumstances and priorities receive consideration from the government. Hence, the government should maintain the provision of free housing and ensure the timely distribution of medical supplies.

Interestingly, participants reported having work-related stress (2.92 ± 0.84). This might be due to a shortage of manpower, which compels the midwives to engage in multitasking, such as managing clinical work, administrative work, and emergency outcalls [3, 37]. Inadequate staffing leads to high workloads [38]. This is further exacerbated by the soaring demand for health services with the increasing burden of both non-communicable diseases and communicable diseases, including the COVID-19 pandemic [3, 37]. Previous studies have reported that work-related stress in the health workforce was due to family obligations [24], security problems [5] and lack of management support [39]. Thus, the number of midwives in each PHCF should be based on the workload. Increased investment in HRH is linked to enhanced productivity and performance. Future studies may focus on identifying predictors of stressful working conditions among midwives, providing valuable insights for the government in formulating and implementing programs or interventions aimed at mitigating work-related stress among midwives in rural areas.

5. LIMITATIONS

This cross-sectional study cannot determine the causality within the relationship between the retention of midwives in rural areas and its determinants. Besides, the findings from this study cannot be generalized to FHAs in urban areas since this study was conducted among the midwives recruited in rural

areas. However, the involvement of the total population minimized selection bias, and the findings of this study are nearly accurate and can be generalized across all the rural midwives in Bhutan.

CONCLUSION AND RECOMMENDATION

A high retention intention is positively correlated with age, monthly income, number of years in service, personal origins and values, family and community aspects, working and living conditions, career-related opportunities, financial incentives, and mandatory service. Financial incentives and working and living conditions can strongly predict the retention of midwives in rural areas. Though the study unveiled a high retention intention, the RGoB and MoH should consider the workload of midwives that may lead to work-related stress and the development of community facilities. Furthermore, this study recommends fostering a positive working and living environment and sustaining the provision of financial incentives to retain midwives in rural Bhutan.

AUTHORS' CONTRIBUTIONS

W.J. conceptualized the research design. K.J. gathered the data. W.J. and K.J. participated in the data analysis, interpretation, and writing of the manuscript. The final manuscript was read and approved by both authors.

LIST OF ABBREVIATIONS

MCH	=	Maternal and Child Health
LMICs	=	Low- and Middle-income Countries
FHA	=	Female Health Assistant
PHCFs	=	Primary Healthcare Facilities
MoH	=	Ministry of Health
HRH	=	Human Resources for Health
RGoB	=	Royal Government of Bhutan
DHOs	=	District Health Officers

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

This study was approved by the Institutional Review Board of Naresuan University in Thailand (Approval number 205/2022) and the Research Ethics Board of Health in Bhutan (Approval number REBH/PO/2022/020). Further, an administrative clearance was sought from the Ministry of Health, Bhutan (Vide Letter Number MoH/PPD/ADM.Cl/9/2022/015), and respective District Health Officers were informed about the study.

CONSENT FOR PUBLICATION

Participants were given information about the study and the option to provide their consent or decline to participate in the study. All data were anonymized.

HUMAN AND ANIMAL RIGHTS

No animals were used in this research. All human research procedures followed were in accordance with the ethical standards of the committee responsible for human experimentation (institutional and national), and with the Helsinki Declaration of 1975, as revised in 2013.

STANDARDS OF REPORTING

STROBE guidelines were followed.

AVAILABILITY OF DATA AND MATERIALS

Data supporting the results of this study are available upon reasonable request from the corresponding author [W.J.], on special request.

FUNDING

None.

CONFLICT OF INTEREST

The authors declare no conflict of interest, financial or otherwise.

ACKNOWLEDGEMENTS

The authors would like to sincerely thank the respective District Health Officers for their assistance in data collection and all the midwives working at PHCFs in Bhutan for participating in this study.

REFERENCES

- [1] Nove A, Friberg IK, de Bernis L, *et al.* Potential impact of midwives in preventing and reducing maternal and neonatal mortality and stillbirths: A Lives Saved Tool modelling study. *Lancet Glob Health* 2021; 9(1): e24-32. [http://dx.doi.org/10.1016/S2214-109X(20)30397-1] [PMID: 33275948]
- [2] Zapata T, Buchan J, Tangcharoensathien V, *et al.* Rural retention strategies in the South-East Asia Region: Evidence to guide effective implementation. *Bull World Health Organ* 2020; 98(11): 815-7. [http://dx.doi.org/10.2471/BLT.19.245662] [PMID: 33177780]
- [3] World Health Organization. Improving retention of health workers in rural and remote areas: Case studies from WHO South-East Asia Region. New Delhi: WHO, Regional Office for South-East Asia 2020.
- [4] Health workforce requirements for universal health coverage and the sustainable development goals. World Health Organization 2016.
- [5] Mansoor GF, Hashemy P, Gohar F, Wood ME, Ayoubi SF, Todd CS. Midwifery retention and coverage and impact on service utilisation in Afghanistan. *Midwifery* 2013; 29(10): 1088-94. [http://dx.doi.org/10.1016/j.midw.2013.07.021] [PMID: 24016552]
- [6] National Statistics Bureau. Population and housing census of Bhutan. Thimphu: National Statistics Bureau 2018.
- [7] Wangmo D, Windosr C, Clark M, Clark M. Positioning nurses in primary health care in Bhutan. *Bhutan Health J* 2018; 4(1): 33-41. [http://dx.doi.org/10.47811/bhj.54]
- [8] Lehmann U, Dieleman M, Martineau T. Staffing remote rural areas in middle- and low-income countries: A literature review of attraction and retention. *BMC Health Serv Res* 2008; 8(1): 19. [http://dx.doi.org/10.1186/1472-6963-8-19] [PMID: 18215313]
- [9] Makowiecka K, Achadi E, Izati Y, Ronsmans C. Midwifery provision in two districts in Indonesia: How well are rural areas served? *Health Policy Plan* 2007; 23(1): 67-75. [http://dx.doi.org/10.1093/heapol/czm036] [PMID: 17971368]
- [10] Ministry of Health. Health Human Resources Development Report. Thimphu: Human Resources Division 2021.
- [11] Ministry of Health. Strategic Direction for Nursing and Midwifery 2021-2025. Thimphu: Nursing Program, MoH 2021.
- [12] Belaid L, Dagenais C, Moha M, Ridde V. Understanding the factors affecting the attraction and retention of health professionals in rural and remote areas: A mixed-method study in Niger. *Hum Resour Health* 2017; 15(1): 60. [http://dx.doi.org/10.1186/s12960-017-0227-y] [PMID: 28056998]
- [13] El-Jardali F, Alameddine M, Jamal D, *et al.* A national study on nurses' retention in healthcare facilities in underserved areas in Lebanon. *Hum Resour Health* 2013; 11(1): 49. [http://dx.doi.org/10.1186/1478-4491-11-49] [PMID: 24079458]
- [14] El-Jardali F, Murray SF, Dimassi H, *et al.* Intention to stay of nurses in current posts in difficult-to-staff areas of Yemen, Jordan, Lebanon and Qatar: A cross-sectional study. *Int J Nurs Stud* 2013; 50(11): 1481-94. [http://dx.doi.org/10.1016/j.ijnurstu.2013.02.013] [PMID: 23545140]
- [15] Adegoke AA, Atiyaye FB, Abubakar AS, Auta A, Aboda A. Job satisfaction and retention of midwives in rural Nigeria. *Midwifery* 2015; 31(10): 946-56. [http://dx.doi.org/10.1016/j.midw.2015.06.010] [PMID: 26144368]
- [16] Abe K, Ros B, Chea K, Tung R, Fustukian S. Factors influencing the retention of secondary midwives at health centres in rural areas in Cambodia: the role of gender—a qualitative study. *BMC Health Serv Res* 2021; 21(1): 1251. [http://dx.doi.org/10.1186/s12913-021-07239-w] [PMID: 34798871]
- [17] World Health Organization. Increasing access to health workers in remote and rural areas through improved retention: global policy recommendations. Geneva: WHO press 2010.
- [18] Henderson LN, Tulloch J. Incentives for retaining and motivating health workers in Pacific and Asian countries. *Hum Resour Health* 2008; 6(1): 18. [http://dx.doi.org/10.1186/1478-4491-6-18] [PMID: 18793436]
- [19] Munga MA, Torsvik G, Maestad O. Using incentives to attract nurses to remote areas of Tanzania: A contingent valuation study. *Health Policy Plan* 2014; 29(2): 227-36. [http://dx.doi.org/10.1093/heapol/czt007] [PMID: 23479271]
- [20] Dotson MJ, Dave DS, Cazier JA, Spaulding TJ. An empirical analysis of nurse retention: What keeps RNs in nursing? *J Nurs Adm* 2014; 44(2): 111-6. [http://dx.doi.org/10.1097/NNA.000000000000034] [PMID: 24451449]
- [21] Thinley S, Tshering P, Wangmo K, Wangmo K, Wangchuk N. The Kingdom of Bhutan health system review. New Delhi: WHO, Regional Office for South-East Asia 2017.
- [22] Faul F, Erdfelder E, Buchner A, Lang AG. Statistical power analyses using G*Power 3.1: Tests for correlation and regression analyses. *Behav Res Methods* 2009; 41(4): 1149-60. [http://dx.doi.org/10.3758/BRM.41.4.1149] [PMID: 19897823]
- [23] Ditlopo P, Blaauw D, Bidwell P, Thomas S. Analyzing the implementation of the rural allowance in hospitals in North West Province, South Africa. *J Public Health Policy* 2011; 32(S1): S80-93. [http://dx.doi.org/10.1057/jphhp.2011.28] [PMID: 21730996]
- [24] Haskins JL, Phakathi SA, Grant M, Horwood CM. Factors influencing recruitment and retention of professional nurses, doctors and allied health professionals in rural hospitals in KwaZulu Natal. *Health SA* 2017; 22: 174-83. [http://dx.doi.org/10.4102/hsag.v22i0.984]. [http://dx.doi.org/10.1016/j.hsag.2016.11.002]
- [25] Ojaka D, Olango S, Jarvis J. Factors affecting motivation and retention of primary health care workers in three disparate regions in Kenya. *Hum Resour Health* 2014; 12(1): 33. [http://dx.doi.org/10.1186/1478-4491-12-33] [PMID: 24906964]
- [26] Nowrouzi-Kia B, Fox MT. Factors associated with intent to leave in registered nurses working in acute care hospitals: A cross-sectional study in Ontario, Canada. *Workplace Health Saf* 2020; 68(3): 121-8. [http://dx.doi.org/10.1177/2165079919884956] [PMID: 31872795]
- [27] Ofei AMA, Paarima Y. Nurse managers leadership styles and intention to stay among nurses at the unit in Ghana. *Int J Health Plann Manage* 2022; 37(3): 1663-79. [http://dx.doi.org/10.1002/hpm.3433] [PMID: 35150018]
- [28] Hines S, Wakerman J, Carey TA, Russell D, Humphreys J. Retention strategies and interventions for health workers in rural and remote areas: a systematic review protocol. *JBISIRIR* 2017; 004009 [PMID: 31567832]
- [29] Best JW, Kahn JV, Jha AK. Research in education. 10th ed. Uttar Pradesh, India: Pearson Education India 2016.
- [30] Lynn MR. Determination and quantification of content validity. *Nurs Res* 1986; 35(6): 382-6. [http://dx.doi.org/10.1097/00006199-198611000-00017] [PMID: 3640358]
- [31] McNeeley S. Sensitive issues in surveys: Reducing refusals while increasing reliability and quality of responses to sensitive survey items. In: Gideon L, Ed. Handbook of survey methodology for the social sciences. New York: Springer New York 2012. [http://dx.doi.org/10.1007/978-1-4614-3876-2_22]
- [32] Corp IBM. IBM SPSS Statistics for Windows, Version 22.0. Armonk, NY: IBM Corp 2013.
- [33] Hair J, Black W, Babin B, Anderson R, Tatham R. Multivariate Data Analysis. 6th ed. New Jersey: Pearson Prentice Hall 2006.

- [34] Tabachnick BG, Fidell LS. Using multivariate statistics. 6th ed. Boston: Pearson Education 2013.
- [35] Berman L, Nkhoma L, Prust M, *et al.* Analysis of policy interventions to attract and retain nurse midwives in rural areas of Malawi: A discrete choice experiment. *PLoS One* 2021; 16(6): e0253518. [<http://dx.doi.org/10.1371/journal.pone.0253518>] [PMID: 34153075]
- [36] Robyn PJ, Shroff Z, Zang OR, *et al.* Addressing health workforce distribution concerns: A discrete choice experiment to develop rural retention strategies in Cameroon. *Int J Health Policy Manag* 2015; 4(3): 169-80. [<http://dx.doi.org/10.15171/ijhpm.2015.27>] [PMID: 25774374]
- [37] Ministry of Health. Annual Health Bulletin. Thimphu: Policy & Planning Division 2021.
- [38] Okoroafor SC, Osubor MK, Nwachukwu C. Factors influencing attraction and retention of frontline health workers in remote and rural areas in Nigeria: A discrete choice experiment. *J Public Health Policy* 2022; 43(3): 347-59. [<http://dx.doi.org/10.1057/s41271-022-00351-z>] [PMID: 35676329]
- [39] Mothiba TM, Skaal L, Berggren V. Listen to the midwives in Limpopo Province South Africa: An exploratory study on maternal care. *Open Public Health J* 2019; 12(1): 424-9. [<http://dx.doi.org/10.2174/1874944501912010424>]

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