

Research article

Is a decentralized continuing medical education program feasible for Chinese rural health professionals?

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Abstract

Purpose: Rural health professionals in township health centers (THCs) tend to have less advanced educational degrees. This study aimed to ascertain the perceived feasibility of a decentralized continuing medical education (CME) program to upgrade their educational levels. **Methods:** A cross-sectional survey of THC health professionals was conducted using a self-administered, structured questionnaire in Guangxi Zhuang Autonomous Region, China. **Results:** The health professionals in the THCs were overwhelmingly young with low education levels. They had a strong desire to upgrade their educational degrees. The decentralized CME program was perceived as feasible by health workers with positive attitudes about the benefit for license examination, and by those who intended to improve their clinical diagnosis and treatment skills. The target groups of such a program were those who expected to undertake a bachelor's degree and who rated themselves as "partially capable" in clinical competency. They reported that 160-400 USD annually would be an affordable fee for the program. **Conclusion:** A decentralized CME program was perceived feasible to upgrade rural health workers' education level to a bachelor's degree and improve their clinical competency.

Keywords: China; Clinical competence; Continuing medical education; Health personnel; Licensure

Introduction

Accessing continuing medical education (CME) and professional development is necessary for health workers to maintain competence and improve performance [1]. Moreover, evidence has suggested that CME programs can increase retention if the programs focus on the expressed needs of rural health workers [2, 3]. In China, it had been documented that health training programs have a significant relationship with improving service quality for rural health workers in township health centers (THCs) [4, 5]. In comparison with other middle-income developing countries, the Chinese rural health workers in THCs had a relatively low level of education. The majority

of health workers was young and had attained a secondary technical or junior college education. A strong perceived need to upgrade their educational degrees through CME programs was reported in a previous study [6]. However, the barriers, including lack of time to study and insufficient funding hindered them from participating in such programs. To train students closer to rural communities and facilitate professional development were two of the evidence-based educational interventions recommended by World Health Organization [7]. In order to meet rural health workers' need to earn a more advanced degree, study near their workplace, and at the same time, overcome their time and budget limitations, we have proposed a decentralized degree-linked CME program. This program was designed to facilitate health workers' studying theory in local medical universities and undergoing supervised practice to strengthen their medical skills in county hospitals. After they meet the requirements for a bachelor's degree, they would obtain the degree from their local university.

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How feasible would the THC health workers perceive this decentralized program to be? Who would enroll in this program? What factors would facilitate or inhibit this program? It is imperative to answer these questions from the potential learners' perspectives.

Guangxi is a southern province of China, divided into 14 prefecture-level cities, 109 county-level cities, and 1,126 towns. There are 46 tertiary hospitals, 153 county hospitals, and 1,278 THCs. Currently, there are 15,488 health workers with a license or assistant license, and 12,238 licensed nurses in the THCs. On average, there are 12.11 health workers and 9.58 nurses in every hospital. We have observed that the health workers who were physicians and nurses have typically attended two types of CME programs: non-degree programs and degree-linked adult education programs. The majority of health workers want to study at a medical university to earn a more advanced degree and improve their clinical skills in higher county or city level hospitals. This study aimed to assess the perceived feasibility of a decentralized degree-linked CME program by health workers in Guangxi and to explore the factors related to respondents who intend to upgrade their degree through such a program.

METHODS

Study design

A cross-sectional survey with a self-administered questionnaire was conducted for this study.

Study site

This study was conducted in Pingguo, Gongcheng, and Luchuan, located in the northwest, northeast, and southeast of Guangxi, respectively. They are typical average counties representing high, middle, and low levels of socioeconomic development respectively as classified by the government [8].

Study population

The health workers in all THCs of the three counties were included except those who had been working there less than six months and those who would retire within a year.

Data collection method and instruments

The data were collected from March to August of 2014. The questionnaire for the Second National Survey of Demographic Data and Training Demand for Health Workers in Township Health Centres by the Chinese Ministry of Health in 2011 was adapted for this study. A previous study has confirmed good validity and reliability of this questionnaire[6].

Data analysis

EpiData software (EpiData Association, Odense, Denmark) was used for data entry. All data analyses were performed using R version 3.1.3 (<http://www.R-project.org/>) with the EpiCalc package 2.15.1.0 (<http://CRAN.R-project.org/package=epicalc>). The chi-square test or Fisher's test were used as appropriate for categorical variables. Logistic regression analysis was used to identify the factors related to respondents who in-

Table 1. Demographic information on the health workers in township health centers

Demographic	Physician (n = 193)	Nurse (n = 201)	Health workers without a license (n = 176)	Total (n = 570)
Gender ^{a)}				
Male	94 (49.0)	2 (1.0)	42 (24.0)	138 (24.0)
Female	98 (51.0)	198 (99.0)	133 (76.0)	429 (76.0)
Age ^{a)} , years				
< 25	77 (39.9)	150 (74.6)	145 (82.4)	372(65.3)
25-44	95 (49.2)	40 (19.9)	27 (15.3)	162(28.4)
45+	21 (10.9)	11 (5.5)	4 (2.3)	36 (6.3)
Work experience ^{a)} , years				
Median (IQR)	13 (9,18)	8 (4,14)	4 (2,10)	9 (4,15)
Current education ^{a)}				
Senior Secondary School and Below	3 (1.6)	2 (1.0)	12 (6.8)	17 (3.0)
Secondary Technical School	49 (25.4)	93 (46.3)	80 (45.5)	222 (38.9)
Junior college	133 (68.9)	105 (52.2)	81 (46.0)	319 (56.0)
Undergraduate	8 (4.1)	1 (0.5)	3 (1.7)	12 (2.1)
Expected educational degree for study ^{a)}				
Junior college study	32 (16.6)	64 (31.8)	45 (25.6)	141 (25.0)
Bachelor degree study	110 (57.0)	108 (53.7)	102 (58.0)	320 (56.0)
No demand	51 (26.4)	29 (14.4)	29 (16.5)	109 (19.0)

Data were given as n (%). ^{a)}P-value < 0.001.

tended to upgrade their degree through the decentralized program. Statistical significance was set at 5%.

Ethical approval

The study was approved by the Ethics Committee of the Faculty of Medicine, Prince of Songkla University, Thailand (No: 56-317-18-5). Informed verbal consent was obtained from all the participants.

RESULTS

Demographic information

Out of 706 working medical professionals, 669 (94.7%) participated and completed the questionnaire. This study excluded those who intended to enrol in a program of study for a postgraduate degree (76 persons) or secondary technical education (23 persons) because these health workers were not the main CME target group. The demographic characteristics of the remaining 570 respondents are summarized in Table 1. The respondents were young (65.3% of them were less than 25 years old) with a median working time of nine years in the health care. The majority had a junior college or secondary technical school education background. More than half of them intended to continue their studies to earn a bachelor's degree, while 25% of the respondents were aiming to study for a degree at a junior college.

Demographic data and factors related to perceived feasibility of decentralized program

As shown in Table 2, physicians were more likely to consider the decentralized program feasible, while nurses tended to think it less feasible. Those had positive attitudes about the benefits of passing a license examination and those who intended to improve their clinical diagnosis and treatment skills were more likely to perceive this program feasible.

Association between factors and perceived feasibility of a decentralized program

Table 3 notes that those health workers with a positive attitude about the benefits of passing a license examination were 4.92 times (95%CI: 2.38,10.15) more likely to think the decentralized program feasible for themselves compared with those who held negative attitudes. Other factors related to the perceived feasibility of this program were the desired educational degree (Adjusted odds ratio [AOR] 2.22, 95% CI 1.02 to 4.84), a self-rating of "partially capable" in competency (AOR 3.60, 95% CI 1.24 to 10.45) and desire to improve their clinical diagnosis and treatment skills (AOR 2.52, 95% CI 1.32 to 4.81). Those who could only afford 160-400 USD annually for degree study were 5 times more likely to perceive this program

Table 2. Demographic data and factors related to perceived feasibility of a decentralized program

Variables	Feasible (N = 366)	Infeasible (N = 145)	P value
Gender			0.12
Male	96 (26.4)	28 (19.3)	
Female	268 (73.6)	117 (80.7)	
Age, years			0.46
< 25	237 (64.8)	102 (70.3)	
25-44	105 (28.7)	36 (24.8)	
45+	24 (6.6)	7 (4.8)	
Current education			0.61
Senior secondary school and below	8 (2.2)	5 (3.4)	
Secondary technical school	144 (39.3)	58 (40.0)	
Junior college	208 (56.8)	78 (53.8)	
Undergraduate	6 (1.6)	4 (2.8)	
License			< 0.01
Physician	137 (37.4)	32 (22.1)	
Nurse	122 (33.3)	62 (42.8)	
Health worker without a license	107 (29.2)	51 (35.2)	
Annual affordable fees for degree study			0.12
160-240 USD	193 (54.8)	71 (50)	
240-320 USD	94 (26.7)	39 (27.5)	
320- 400 USD	56 (15.9)	22 (15.5)	
> 400 USD	9 (2.6)	10 (7.0)	
Perceived benefit for license exam			< 0.01
Positive	243 (70.8)	56 (43.4)	
Neutral	73 (21.3)	48 (37.2)	
Negative	27 (7.9)	25 (19.4)	
Expected educational degree for study			0.18
Junior college study	94 (25.7)	41 (28.3)	
Bachelor degree study	230 (62.8)	80 (55.2)	
No demand ^{a)}	42 (11.5)	24 (16.6)	
Self-rated competency			0.14
Fully capable	100 (27.6)	43 (30.1)	
Mostly capable	208 (57.5)	88 (61.5)	
Partially capable	49 (13.5)	9 (6.3)	
A little capable	5 (1.4)	3 (2.1)	
Study objectives			< 0.01
Clinical diagnosis and treatment	228 (62.5)	55 (38.5)	
Basic theory	54 (14.8)	35 (24.5)	
Policy and regulations	63 (17.3)	32 (22.4)	
Other	20 (5.5)	21 (14.7)	

^{a)}No demand: the respondents do not envision going back to school for a degree. Numbers in brackets are percent unless otherwise stated.

feasible in comparison with those who could afford more than 400 USD.

DISCUSSION

The health workers in THCs are overwhelmingly young with a low education level. The need to earn a more advanced

Table 3. Association between factors and perceived feasibility of a decentralized program with perception as ‘infeasible’ as reference

Variables	AOR ^{a)} (95% CI)	P (Wald's test)	P (LR-test)
Gender: female vs. male	0.97 (0.50,1.88)	0.92	0.92
License: ref. = no license			0.15
Physician	1.38 (0.70,2.74)	0.35	
Nurse	0.69 (0.37,1.27)	0.23	
Perceived benefit for license exam: ref. = Negative			< 0.01
Positive	4.92 (2.38,10.15)	< 0.01	
Neutral	1.27 (0.59,2.74)	0.54	
Expected educational degree for study: ref. = No demand			0.03
Junior college study	1.22 (0.52,2.85)	0.64	
Bachelor degree study	2.22 (1.02,4.84)	0.04	
Affordable fees annually: 160-400 USD vs. over 400 USD	5.04 (1.5,16.93)	0.01	0.01
Self-rated competency: ref. = Fully capable			0.02
Mostly capable	0.89 (0.51,1.56)	0.69	
Partially capable	3.60 (1.24,10.45)	0.02	
A little capable	0.67 (0.12,3.76)	0.65	
Study objectives: ref. = Basic theory			0.01
Clinical diagnosis and treatment	2.52 (1.32,4.81)	0.01	
Policy and regulations	1.70 (0.80,3.60)	0.17	
Other	0.69 (0.26,1.82)	0.45	

^{a)}AOR, Adjusted odds ratio; CI, confidence interval.

educational degree is strong. The decentralized degree-linked CME program was perceived to be feasible by health workers with positive attitudes about the benefit of passing a license examination, and by those intended to improve their clinical diagnosis and treatment skills. The target group of such a program were those who desire to study for a bachelor's degree, and those who rated themselves “partially capable” in competency. They could afford fees of 160-400 USD annually to participate in a training program.

Uneven distribution of health workers has consistently plagued rural Chinese residents' access to health care, which is compounded by low clinical competency and a limited volume of health training tailored to their needs. Between the two types of CME training programs, the non-degree program is only open for those with an intermediate level of technical credentials (which required a bachelor's degree holder working for at least five years after graduation and passing the national examination for an intermediate technical title) or a senior title. The majority of THC health workers have no or junior technical titles, so a degree-linked CME program is their first and only choice in health professional training.

The fact that the decentralized degree-linked program was perceived feasible by the majority of clinical competency-focused health workers has important policy implications. A decentralized medical education program proved to be effective to produce and retain competent health workers in other countries[9]. The involvement of local universities would help identify the needs of rural health workers and build proper

curriculum for rural medicine. For county hospitals were closer to THCs and better understood the local conditions, so it would be more feasible to place health workers in clinical study at county level hospitals.

This study also suggested that prompt investment should be allocated to strengthen the rural health workforce in THCs. In 2009, the Chinese government unveiled an ambitious health-care reform plan, and committed to spending about US\$125 billion to provide affordable and equitable basic health care for all by 2020[10]. Evidence showed that the infrastructure of THCs had been greatly improved in the past several years, but this had not transferred into better service quality because of health training lagged behind[11]. The health workers perceived that it would be feasible to spend 160--400 USD to study every year. If more financial incentives and favorable policies provided to these health workers, this decentralized program would be more feasible and applicable to rural health workers in China.

In conclusion, this study confirmed the feasibility of a decentralized CME program among health workers in THCs and suggested policy implications to China and other countries with similar aspirations to boost health training for rural health workers. A decentralized CME program was perceived feasible to upgrade the health workers' education level to bachelor degree and improve their clinical competency. A further stakeholder analysis on the readiness of education providers including medical universities, county or city hospitals and health departments would clarify the feasibility of this program.

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Conflict of interest

No potential conflict of interest relevant to this article was reported.

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Supplementary material

Audio recording of the abstract.

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