

Are public health physicians still needed in medically underserved rural areas in Korea?

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Abstract

Public health physicians (PHPs) are certified physicians who are serving in a public health center or subcenter in a rural village, instead of serving in the military. However, the PHP program has recently become the subject of a profound debate, over 30 years after its adoption. In this study, we attempted to ascertain physicians' perspectives on the PHP program, including: whether the PHP policy should continue; if they agree on changing the role of PHPs in healthcare; what would be the desired role of PHPs; and what resources would be required and what possible barriers would be anticipated under the changes. We selected 88 PHPs as our study sample using quota sampling. Over 60% of respondents were in support of continuing the PHP program. They believed some remote islands and mountainous areas are still in need of public healthcare doctors. However, some of them believed that the role of PHPs should be changed to take on community health promotion, because the problem of medically underserved rural areas has almost been resolved. However, people living in rural areas are ageing and suffering from a lack of education and health information. In particular, in order to successfully transition into new roles, PHPs must be provided with continuing education and professional development programs covering their new responsibilities. It is imperative to refurbish the PHP program to meet current needs and continue its central role in public healthcare.

Abbreviations: MUA = medically underserved area, PHP = public health physician, PSA = physician shortage area.

Keywords: medically underserved area, military medicine, physician, physician shortage area, public health

1. Introduction

A medically underserved area (MUA) or physician shortage area (PSA) is a “geographic location which has insufficient health resources (manpower and/or facilities) to meet the medical needs of the resident population.”^[1] Theoretically, PSAs can be divided into areas with no doctors (ie, extreme PSAs) and those with an insufficient number of physicians. In any case, residents living in a PSA are more likely to have health problems because they struggle to access healthcare services. In particular, residents living in extreme PSAs can face a more serious situation.^[2–6] PSAs can exist not only in middle- and low-income countries but also in developed countries because physicians are likely to not want to

work in rural and remote areas.^[2–4] In order to solve the PSA problem, many countries have been working hard to hire and maintain physicians and have employed various policies. The most representative ones are financial incentives, scholarship support, recruiting rural students, international recruitment, undergraduate placement focused on rural or primary care, postgraduate training, wellbeing or peer support initiatives, and more.^[2–12]

In Korea, the PSA problem was partially solved using the country's conscription system (also known as mandatory military service), because every young male adult in Korea must serve in the military for a set time. This was a unique solution for the Korean situation. As of 1974, there were many dismal villages in Korea. There were no doctors in about 600 areas. By placing medical students and doctors in these areas to complete their military service, village doctors could be found in a short time. Through this policy, PSAs were transformed into areas where at least 1 physician was present, and this temporarily resolved the problem (there were still PSAs, but at minimum 1 doctor was present). We call doctors doing their military service in PSAs “public health physicians” (PHPs). That is, PHPs, also known as public health doctors, are certified physicians who are serving at a public health center or subcenter in a rural village, instead of in the military. Although all Korean male citizens aged 19 and over are subject to compulsory military service under the Constitution of the Republic of Korea, the PHP program allows extra-ordinary military service for medical personnel working in PSAs and exempts them from military duty after 3 years of service as a PHP.^[13,14] Since its inception in 1979, the PHP program has been recognized as an essential intervention to redress the inequitable distribution of healthcare professionals in rural and remote areas.

As of 1974, there were over 600 villages without medical facilities in the country. But by 1983, just 4 years after the introduction of the PHP program, the lack of healthcare services in rural areas had been resolved.^[15]

Editor: Ediriweera Desapriya.

BJN and JYL equally contributed to this work.

Funding/support: This study was supported by the Ministry of Health and Welfare (Korea) N0: 14–17.

The authors have no conflicts of interest to disclose.

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Medicine (2017) 96:19(e6928)

Received: 25 September 2016 / Received in final form: 13 April 2017 /

Accepted: 22 April 2017

<http://dx.doi.org/10.1097/MD.0000000000006928>

However, the PHP program has become the subject of profound debate recently, over 30 years after its adoption. The most radical argument calls for its abolishment,^[16] claiming that while PHPs have played an essential role in public healthcare, the program is no longer needed. With advancements in transportation, the number of villages with limited access to healthcare services (except for some remote islands and mountain areas) has greatly decreased. At the same time, the number of doctors has steadily grown over the years, leading to the opening of private clinics in some villages where a PHP is assigned. Moreover, the supply of PHPs to public and private hospitals in some areas as cheap labor is distorting the overall healthcare system. In extreme cases, some PHPs are illegally practicing medicine part-time. Hence, it is argued that the PHP program has more detriments than benefits at this point. In contrast, the program is supported by those who see it as effectively serving its purpose by having the positive effect of eliminating villages without medical facilities and ensuring medical accessibility in rural areas. Supporters think that instead of abolishing the program entirely, it should be reinvented to take on a different role.^[13,17–20] In particular, the population of rural areas is declining and also rapidly ageing, and any resulting changes in disease prevalence should be dealt with through an integrated healthcare service. The existing acute-care-centered healthcare system should be reformed into a more tailored system for serving the needs of an ageing population and patients with chronic conditions.^[21,22]

In all, the PHP program is facing new challenges. However, no prior studies have delved into the opinions of PHPs. In this study, we asked PHPs about their perspectives on the PHP program, including: whether the PHP policy should continue; if they agree on changing the role of PHPs in healthcare; what would be the desired role of PHPs under the new program; and what resources would be required and what possible barriers would be anticipated under the changes.

2. Methods

2.1. Study population

Among the 7 metropolitan areas and 9 provinces of Korea, we selected regions from 7 provinces (Gangwon, Chungbuk, Chungnam, Gyeongbuk, Gyeongnam, Jeonbuk, and Jeonnam) containing rural and remote areas. Using quota sampling, we selected a subregion from each of the 7 provinces that was a small area (county or small city) and interviewed all PHPs assigned to the area. As a result, we selected 88 PHPs as our study sample: Chuncheon-si, Gangwon (12 PHPs), Yeongdong-gun, Chungbuk (12), Seosan-si, Chungnam (12), Imsil-gun, Jeonbuk (20), Yeonggwang-gun, Jeonnam (11), Uljin-gun, Gyeongbuk (12), Yangsan-si, and Gyeongnam (9).

2.2. Questionnaire

We developed a questionnaire with items in 3 categories. The 1st category regarded perceptions on the need to continue the PHP program; we asked if it should be continued or abolished, and why they thought so (Table 2). The 2nd category contained items on perceptions of the need to change the duties of PHPs; we first investigated the current role of PHPs and asked for comments on how the role should be changed in the future, as well as the reasons for agreement or disagreement (Table 3). The last category covered items on willingness to participate and necessary support if the functions of PHPs are changed.

Table 1

General characteristics of study participants.

Variable	Response (%)
Total	48 (100)
Working institution	
Public health center	6 (12.5)
Public health subcenter	36 (75.0)
Hospitalized public health center	6 (12.5)
Current workplace location	
Chuncheon-si, Gangwon-do	6 (12.5)
Yeongdong-gun, Chungbuk-do	7 (14.6)
Seosan-si, Chungnam-do	8 (16.7)
Imsil-gun, Jeonbuk-do	9 (18.8)
Yeonggwang-gun, Jeonnam-do	6 (12.5)
Uljin-gun, Gyeongbuk-do	8 (16.7)
Yangsan-si, Gyeongnam-do	4 (8.3)
Qualification	
General physician	24 (50.0)
Specialist	24 (50.0)
Age	
Mean \pm SD	30.9 \pm 2.2
Marital status	
Married	20 (41.7)
Single	28 (58.3)
Career	
1st year	15 (31.3)
2nd year	12 (25.0)
3rd year	21 (43.8)
Average number of patients per day	
Mean \pm SD	16.0 \pm 15.2
Average salary per month	
Less than 1.5 million KRW (less than USD 1302)	2 (4.2)
1.5 – Less than 2.0 million KRW (USD 1302 – less than 1736)	12 (25.0)
2.0 – less than 2.5 million KRW (USD 1736 – less than USD 2171)	24 (50.0)
More than 2.5 million KRW (more than USD 2171)	10 (20.8)
Presence of other healthcare institutions within your area	
Yes	32 (66.7)
No	16 (33.3)

KRW = Korean won, SD = standard deviation, USD = United States dollars.

In a case where the role of PHPs is changed to provide comprehensive healthcare services to local communities, we asked what kinds of preparedness and support from the government would be needed (Table 4).

2.3. Survey

A web-based survey program (Survey-Monkey.Com LLC, Portland, OR) was used to administer the questionnaire. The survey was conducted from December 15 to 19, 2014.

2.4. Statistical analysis

Using SPSS Win 19.0K program (IBM, Chicago, IL), frequencies and corresponding percentages were calculated for each questionnaire. Currency was presented in both Korean won (KRW) and United States dollars (USD), with an exchange rate of 1 USD = 1151.8 KRW (average annual rate in 2011).

2.5. Ethics statement

This study was approved by the Institutional Review Board of Konyang University Hospital (IRB No. 2014-11-025-001).

Table 2**Views on the need to continue the public health physician program.**

Questionnaire	Response (%)
Total	48 (100)
Do you agree with the purpose of PHP program to eliminate medically underserved villages (villages without medical doctors or medical facilities)?	28 (58.3)
As medically underserved villages are disappearing in Korea, do you believe the PHP program should continue?	
It should be continued.	32 (66.7)
It should be abolished.	16 (33.3)
The following are reasons for continuing the PHP program. Please indicate if you agree with each item.	
Some areas (ie, remote islands and wilds) are still in need of PHPs.	44 (91.7)
The role of PHPs should be changed rather than abolishing the PHP program itself.	33 (68.8)
Not all doctors can serve as military medical officers.	30 (62.5)
PHPs can provide a differentiated service compared to other medical institutions (ie, through other preventive health services, a home visit program, and activities for health promotion).	18 (37.5)
If there are other medical institutions in your assigned area, do you still believe a PHP is needed in the area?	
No	41 (85.4)
Yes	7 (14.6)

PHP = public health physician.

3. Results**3.1. General characteristics of study participants**

Among the 88 individuals in the initial sample, 63 responded. After excluding missing responses, 48 completed questionnaires were analyzed, giving an overall response rate of 55%. A total of 75.0% of respondents worked at public health subcenters. In terms of qualifications, general

physicians (50%) and specialists (50%) were evenly distributed (Table 1).

3.2. Perceptions on the need to continue the PHP program

When asked if they supported the initial objective of the PHP program to eliminate PSAs in Korea, 58.3% replied "Yes." Asked

Table 3**Opinions on the need to change the role of public health physicians.**

Questionnaire	Response (%)
Total	48 (100)
The following items describe the 7 functions that PHPs are currently carrying out or are capable of. Please indicate the proportional distribution of each function you are engaged in to add up to 100.	
Basic disease treatment in a primary care setting	52.7 ± 21.8
Immunizations and health exams	22.7 ± 17.1
Emergency care	7.7 ± 16.6
Home visit program	4.5 ± 5.7
Health education	3.8 ± 5.5
Other preventive health services	2.8 ± 5.3
Activities for health promotion	2.5 ± 4.9
Please indicate the share of each function that PHPs should be responsible for in the future to add up to 100.	
Basic disease treatment in a primary care setting	27.2 ± 25.1
Immunizations and health exams	17.4 ± 12.5
Health education	14.9 ± 12.5
Activities for health promotion	13.8 ± 11.2
Other preventive health services	11.5 ± 11.3
Emergency care	8.3 ± 11.8
Home visit program	5.0 ± 6.8
Since the existing PHP program has successfully fulfilled its initial objective of eliminating medically underserved villages, some argue that its objective should be changed to provide comprehensive healthcare services to local communities. Do you agree to such a change in the role of PHPs?	28 (58.3)
Why do you agree? (n=28)	
Reduced basic care function due to increased availability of other medical institutions.	27 (96.4)
Increased importance of prevention activities compared to basic care.	26 (92.9)
Synergy effect in health promotion to local citizens if other medical institutions focus on treatment and PHPs focus on other preventive health services and education.	23 (82.1)
Why do you disagree? (n=20)	
Lack of required administrative support	18 (90.0)
Concerns about added responsibilities without pay increase	18 (90.0)
Lack of cooperation among staff	17 (85.0)
Lack of continuity in program due to annual workplace rotation	16 (80.0)
Sense of burden from new responsibilities	14 (70.0)

PHP = public health physician.

Table 4**Willingness to participate and necessary support in case of changed functions of public health physicians.**

Questionnaire	Response (%)
Total	48 (100)
If the role of PHPs was changed to provide comprehensive healthcare service to local communities, the following activities must be expanded. Are you willing to participate?	
Health education	35 (72.9)
Other preventive health services	30 (62.5)
Activities for health promotion (behavioral changes, ie, stop smoking/drinking)	29 (60.4)
Home visit program	18 (37.5)
Would you require continuing education and professional development programs in the following activities should the responsibilities of PHPs change in the future?	
Health education	40 (83.3)
Other preventive health services	39 (81.3)
Immunizations and health exams	38 (79.2)
Activities for health promotion	38 (79.2)
Basic disease treatment in a primary care setting	33 (68.8)
Emergency care	30 (62.5)
Home visit program	28 (58.3)
The following items describe necessary support for PHPs to carry out their new role. Do you agree that the following support is necessary?	
Development of protocol or guideline on health education and activities for health promotion.	43 (89.6)
Improvement in attitudes among nurses and relevant government officials (creating a cooperative atmosphere).	42 (87.5)
Pretraining in health education and activities for health promotion.	40 (83.3)
Facilities and supplies for health education and a home visit program.	38 (79.2)
What is the ideal incentive for PHPs should their role be changed to provide comprehensive healthcare services to local communities?	
Less than 1.0 million KRW (<USD 868.2)	15 (31.3)
1.0 – Less than 2.0 million KRW (USD 868.2–1736.4)	15 (31.3)
2.0 to 3.0 million KRW (USD 1736.4–2604.6)	8 (16.7)
More than 3.0 million KRW (>USD 2604.6)	10 (20.8)
Mean	1.63 million KRW (USD 1389.1)

KRW = Korean won, PHP = public health physician, USD = United States dollars.

whether the PHP program should continue given the current trend of PSAs disappearing across the country, 66.7% said it should continue. When asked about why the PHP program should be continued, the most prevailing reason was “Public health doctors are still in need in some areas, including remote islands and wild areas” (91.7%). On the other hand, 85.4% of respondents indicated “No need for dispatch” of PHPs to areas where other medical institution (s) are available, whereas only 14.6% replied “Dispatch” (Table 2).

3.3. Perceptions on the need to change the duties of PHPs

We identified 7 functions that PHPs are currently carrying out or are capable of and asked about the proportional distribution of each function. The result showed that “basic disease treatment in a primary care setting” (52.7%) and “immunizations and health examinations” (22.7%) made up most of PHPs’ duties. Compared to these primary functions, respondents were seldom engaged in other duties (Table 3).

We then asked what would be the ideal distribution of the functions of PHPs. The responses showed a decreased proportion of “basic disease treatment in a primary care setting” (25.5%) and “immunizations and health examinations” (5.3%), but an increase in share of “activities for health promotion” (11.3%), “health education” (11.1%), and “other preventive health services” (8.7%) (Table 3).

We also asked if respondents agreed with the argument that given that the initial objective of the PHP program to eliminate PSAs in the country has essentially been met, the purpose should be renewed to provide comprehensive health services to local

communities. A total of 58.3% of respondents agreed. To the same group of respondents (58.3%), we asked their reasons for agreeing and received the following results: “decreased role of primary care due to increased availability of other medical institutions” (96.4%), “greater importance of prevention activities compared to primary care” (92.9%), and “emphasis on medical care by other medical institutions and emphasis on other preventive health services and health education by PHP would generate synergy effect in promoting health among local citizens” (82.1%). We asked those who selected “disagree” about the need to change the purpose of PHPs and the reasons for their answer. The responses were “concerns about potential lack of administrative support that would be needed” (90.0%), “concerns about added burden of responsibilities without additional pay” (90.0%), “lack of cooperation among staff members” (85.0%), “inability to maintain job continuity due to annual rotation of workplace” (80.0%), and “sense of increased burden due to additional responsibilities” (70.0%) (Table 3).

3.4. Willingness to participate and necessary support in case of changed functions of PHPs

We asked the respondents about their willingness to participate in additional programs resulting from switching the role of PHPs to provide comprehensive healthcare services to local communities. The majority (over 60%) replied that they intend to participate in health education (72.9%), other preventive health services (62.5%), and activities for health promotion (60.4%), but only 37.5% indicated favorable intentions toward a home visit program. Over half of respondents replied that they would

require continuing education and a professional development program on public healthcare activities if the responsibilities of PHPs change.

We proposed 4 types of support that would be required by PHPs to implement the possible new responsibilities assigned to them and asked them if they agreed with each item: “development of protocol or guideline on health education and activities for health promotion” received the highest accordance (89.6%), followed by “improvement of attitudes among nurses and relevant government officials (creating cooperative atmosphere)” (87.5%), “pretraining in health education and activities for health promotion” (83.3%), and “facilities or supplies for health education and a home visit program” (79.2%). When asked how much they would want to earn if the current role of PHPs was changed to provide comprehensive healthcare services to local communities, they replied an average incentive of about 1.6 million KRW (USD 1389.10) (Table 4).

4. Discussion

Despite various attempts by the Korean government since 1959 to eliminate PSAs throughout the country (such as expanding the number of public health centers in rural and coastal villages and dispatching specialists to medically underserved regions for a 6-month period), they have not been successful.^[14,23] The government, in turn, shifted its efforts toward increasing and adding medical schools throughout the 1970s to overcome the shortage of medical personnel, and as a result the number of medical school graduates came to outnumber demands for military medical officers.^[15] Beginning in 1979, residual medical officers in the military were dispatched to PSAs, then received an exemption from compulsory military service after 3 years of service as a PHP. This policy has been effective in relieving medically underserved villages in the country, but also has served an integral role in public healthcare. Prior to introducing the PHP program in the late 1970s, many rural and coastal villages in the country were without any medical institution and had poor access to healthcare due to a lack of infrastructure such as roads and transportation. However, transportation has greatly improved over time, allowing better access to medical institutions from these areas, except for some remote islands and mountains. Moreover, the burden of diseases in rural areas is increasing because the young generation has moved to urban areas, lowering the number of inhabitants in the areas; also, the remaining population is ageing. Due to the above-mentioned changes, debate is growing about whether to continue with the existing PHP program. Some argue that the program should be abolished entirely, but others claim that it should continue even if it means changing the role of PHPs. Hence, our study focused on PHPs in Korea, who are the main stakeholders of the PHP program, and attempted to understand their perceptions on whether the PHP program should be continued, and if they agree on changing the role of PHPs, what they believed would be the ideal role under the new changes, what support would be required, and what possible barriers are foreseen.

Over 60% of PHPs were in support of continuing the PHP program despite the fact that extreme PSAs (areas lacking any physician) have almost disappeared from the country. They believed some remote islands and wild areas are still in need of public healthcare doctors and preferred that instead of abolishing the PHP program, the role of PHPs should be changed to include different functions. However, conflicting views were observed on shifting the role of PHPs to provide comprehensive healthcare

services. First, the reason for supporting such a change was the decrease in primary care functions of PHPs due to the increased number of private clinics available in rural areas. In fact, the average number of patients per day treated by the PHPs in our sample was merely 16. Such a low number could imply that private clinics are available in the areas served by PHPs, thus dispersing patients between them. The existence of a private clinic in a region evidently reduces the role of a PHP because active healthcare service is provided by a private clinic physician who is likely to be more experienced and motivated to increase their income compared to a PHP who is dispatched without regard for their specialization. Another reason for supporting the changed role of PHPs is that the importance of prevention activities has been gradually rising due to the ageing population. An ageing population entails an increase in chronic diseases among a population. Chronic diseases are diseases that can be prevented or delayed based on an individual's efforts. Therefore, in order to prevent chronic diseases, lifestyle activity and behavior must change and sustained care by others is required. PHPs can provide such preventive care. Also, elderly residents of rural areas suffer from a lack of education and health information. Therefore, the need for health education and health promotion counseling is increasing.

Although the initial role of PHPs was to provide medical care, since extreme PSAs have almost disappeared, if PHPs must be given a new role, our respondents showed interest in reducing basic disease treatment in a primary care setting and increasing activities such as health education, preventive health services, and health promotion counseling. Yet, they also had some concerns over the changed role of PHPs. First, they were concerned about a lack of administrative support required for the new role of PHPs. For example, legislative grounds for defining the role of PHPs and their scope of work must be established. As existing laws do not stipulate the role of PHPs, broadening their responsibilities would be disturbing from the perspective of PHPs. Patient care is the foremost and most obvious task for any physician, but if problems arise in the course of carrying out other work such as health education or other preventive health services, PHPs would be vulnerable without any legal protection. Second, PHPs feared they would have to take on additional burdens without a pay raise. Because PHPs are exempt from military service in lieu of serving in MUAs, they would not expect to receive increased compensation for any additional work assigned to them. The current salary for a PHP is about 2.1 million KRW (less than USD 1823), which falls well below the average pay at other medical institutions. Therefore, some PHPs might become involved in illegal part-time work off-hours. Another concern is a lack of cooperation among staff members. This is because PHPs rotate their workplace every year. Hence, it is difficult to generate cooperation among nurses and government officials who are employed for a relatively longer term at public health centers.

In order to overcome the above-mentioned concerns among PHPs and successfully transition to new roles for PHPs, the Korean government should take several things into consideration. First, PHPs must be provided with continuing education and professional development programs covering their new responsibilities, such as health education, other preventive health services, and activities for health promotion counseling. In fact, most PHPs have received little or no training in these topics, because most doctors are trained primarily in treatment and physical examination. Besides supplying ongoing education and professional development programs on a regular basis, PHPs would benefit from having a channel to seek answers to questions

that arise in the course of implementing health education or other preventive health services. Furthermore, PHPs would be relieved of any sense of burden from the new responsibilities assigned to them if they were provided with a protocol or guideline on health education and activities for health promotion. Second, the Korean government needs to work on improving the attitudes of the nurses and government officials involved. Under the existing framework of annual rotation, any project led by a PHP at his/her discretion is unlikely to gain full support from the staff. This means that the business process must be systematized so that the project can continue even when the PHP is changed, and also it would be much easier to draw support from staff members. Third, it is essential to provide PHPs with the facilities and supplies required for conducting health education and health promotion counseling. Therefore, the government should identify necessary facilities and supplies for health education and other preventive health services in advance and provide appropriate funding, minimizing the burden on public health centers and PHPs. Last, PHPs must be provided with reasonable academic and financial incentives. In the initial stage of the transition, incentives should be provided as a motivating factor. Then, once the new role of PHPs becomes well-established, incentives should be performance-based to ensure job effectiveness by linking incentives with the outcomes of new activities such as other preventive health services and health education.

It should be noted that our study has a limitation. Our sample was selected from just 7 provinces (excluding urban areas, ie, special cities and metropolitan cities, Gyeonggi, Jeju) in Korea and therefore cannot fully represent all PHPs in the country. However, because we selected the sample from among PHPs assigned to rural areas, as the PHP program was originally intended, and used the quota sampling method, we believe the sample is adequately representative of the entire PHP population.

Despite this limitation, our study is the first of its kind to examine the PHP program from the perspective of PHPs, and therefore our findings are the first to determine the opinions of PHPs on changing their roles and directions.

5. Conclusions

The PHP program is on the verge of being abolished despite the integral role, it has played in Korea's public healthcare system for many years. MUAs have almost disappeared from the country, mainly thanks to the PHP program, but should it be abolished MUAs may pop up again in remote areas without any private medical institutions or market-failing areas due to the low population. Therefore, it is imperative to refurbish the PHP program to meet current needs and continue its central role in public healthcare in Korea.

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