

Evaluate the Effectiveness of Hubbard Purification Rundown Process for Victims of Agent Orange/Dioxin, Related Strengths and Challenges

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Research

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Abstract

Objective: The aim of this study was to assess the effectiveness of the Hubbard purification rundown (PR) process for victims of Agent Orange (AO)/dioxin at detoxification centers.

Methods: The study was designed as a cross-sectional study combining quantitative and qualitative methods and carried out on 30 dioxin patients, 21 health workers, and 299 medical records in Hanoi and Da Nang centers for dioxin detoxification (CDD) of Vietnam.

Results: A small number of patients were clinically examined before enrolling in and after finishing the treatment, 35% and 0%, respectively. In addition, 15% of patients did not finish their daily PR session in the second step, while 20% of them were not evaluated daily for treatment effectiveness in the fourth step by health workers. Furthermore, 20% of patients did not follow all the 6 steps of the Hubbard PR program. Although centers were sufficiently equipped in terms of infrastructure and equipment, the study showed that there remained barriers in implementing the Hubbard PR process, such as the lack of human resources, wasteful usage of equipment, and the lack of technology application for electronic medical records management. For patients, the difficulties include the lack of awareness and understanding regarding the program, and high temperature during the PR sessions (63%), long PR duration (47%), too many medications and supplements (37%), as well as high cost of treatment (35%).

Conclusion: Ensuring adherence and compliance at all steps in the Hubbard PR process can have a positive impact on the health improvement of AO/dioxin victims.

Introduction

According to the latest statistics from UNDP, there were approximately 4.8 million people in Vietnam who were exposed to dioxin.¹ Many studies have shown that dioxin, once pervades the body, can cause complicated damages at multiple sites, leading to several diseases.^{10–11} Current treatment methods for AO/dioxin victims mainly address symptoms through integrated measures such as improving health with a diet rich in protein, vitamins, stimulating immunity, taking liver supplements to protect liver cells, or taking antioxidants in combination with steaming.

Hubbard purification rundown (PR) is a nonspecialized detoxification method that is being used for the treatment of chronic poisoning and has brought some quite effective results in several countries around the world.^{2,14–15} This method can expel deeply embedded toxins from tissues, especially adipose tissue, push these into the circulatory system, and dispose of these through the excretory system (mainly through perspiration, urine, feces). Scientific evidence shows that Hubbard PR is capable of reducing the concentration of toxins in body fat.^{2,14,16} In Vietnam, the Hubbard PR method was implemented by specialized doctors in the early 2010s. The initial results were highly regarded by those who were exposed to agent orange/dioxin and underwent the treatment.³ However, there are only individual reports for each patient cohort from the detoxification centers, but no overall researches and assessments of the

implementation process, as well as the related advantages and challenges. Therefore, we conducted this study aimed to i) Assess the current state of Hubbard PR implementation at the detox centers, ii) Assess the treatment effectiveness of the Hubbard PR process for patients who were exposed to dioxin, and iii) Analyze the strengths and challenges related to the implementation. The results of this research will be the scientific basis for policymakers to provide guidelines for the implementation and expansion of the Hubbard PR method in detoxification centers across the country.

Materials And Methods

Study subject

For quantitative study: Patient management records of those who underwent Hubbard PR, facilities, equipment, and human resources of the process.

For qualitative study: management board of directors, head doctors at two centers for dioxin detoxification (CDDs). Service providers, including doctors and nurses who work directly with AO/dioxin victims. Patients who underwent Hubbard PR at Da Nang and Hanoi's CDDs.

Study design

This was a cross-sectional descriptive study, combined with qualitative research methods. The qualitative research component was conducted simultaneously with the quantitative component, to supplement information regarding the advantages and challenges related to the implementation of Hubbard PR at CDDs.

Sample size

For the quantitative research component, we used the total population sampling method. According to the statistics of the CDDs, a treatment cohort consists of roughly 30 patients, and 1 course of treatment lasts about 21 days. Patients were treated in cohorts and each patient was managed with a medical record from enrollment until the end of the treatment process. Thus, in the first six months of 2019, there were 299 patient records that were inventoried through pre-designed checklists. Among these, one record was deemed ineligible for quantitative analysis. Reports on human resources, facilities, equipment, materials, and documents facilitating the implementation of Hubbard PR at two CDDs of Hanoi and Da Nang were also inventoried through the checklist.

The qualitative research component used purposive sampling to ensure diversity in terms of age, gender, professional qualifications, working positions, number of years of medical work related to non-specialized detoxification sauna. The qualitative sample size included 14 health workers (HWs) and 30 patients. For the HW group, two CDDs leaders were invited to participate in key informant interviews (KIs), 12 HWs were invited to participate in two focus group discussions (FGD). Regarding the patient population, 30 were interviewed during KIs.

Data collection method

Quantitative data collection

The principal investigator (PI) was the main responsible person for examining medical records and filling out the pre-designed checklists after obtaining permission to access the records from the CDDs' leaders. Firstly, the researcher contacted the leader of the CDDs to obtain approval for data collection and receive data and related reports. After accessing the records, reports, as well as reviewing the facilities and medical equipment, the researcher inventoried books and reports related to patients who underwent Hubbard PR for victims of AO/dioxin within the first 6 months of 2019 (from January 2019 to June 2019) and fill in the pre-designed checklist.

Qualitative data collection

KIIs with leaders of CDDs: the Principal Investigator (PI) contacted the leaders of the CDDs to agree on times and locations for KIIs. Each KII lasted 45 to 60 minutes and was recorded after written consent was obtained from the subject and conducted by the PI and one assistant who was in charge of taking notes and recording. A CDD leader KII guideline was used to guide the interviews.

KIIs with patients: the PI deliberately chose 15 patients who were undergoing Hubbard PR treatment (at the time of the study) from each CDD. Patients who participated in the study were grouped based on their sex and ages. After scheduling and agreeing upon a location for the FGDs, the PI recorded the discussions after obtaining their written consents and conducted the interview. Each interview was about 60 minutes long and followed the KII-with-patient guideline.

FGD: the PI contacted the HWs who directly work with the PR treatment at the CDDs to schedule the FGDs. Each FGD lasted about 120 minutes. The PI facilitated the FGDs based on the FGD guideline after obtaining their written consents, with an assistant who took notes and records.

Data analysis

The quantitative data were entered using Epidata 3.1 and were analyzed using Stata 14.2. Variables were described through frequency and percentage. For qualitative data, information from the qualitative portion was transcribed and stored as Word files. The PI read the content of the KIIs and the FGDs to code the information and group them based on themes, using Excel 2016. Several important details of the subject were extracted to demonstrate the results of the study.

Results

General descriptions of patients

Table 1 shows the average age of AO/dioxin patients was 63 (ranging from 50 to 80 years old). Regarding the gender of patients, 83.3% of patients who underwent Hubbard PR at the 2 CDDs during the first 6 months of 2019 were males. Regarding patients' occupation before retirement, about 61.9% worked non-agricultural jobs (military, governmental, service)

Table 1
General characteristics of patients who underwent Hubbard PR

Indicator	Hanoi	Da Nang	Total
	n = 191	n = 108	n = 299
Sex (%)			
<i>Male</i>	82.7	66.7	83.3
<i>Female</i>	7.3	33.3	16.7
Occupation (%)			
<i>Agricultural</i>	38.7	37.0	38.1
<i>Others</i>	61.3	63.0	61.9
Average age (years)	68 ± 5	57 ± 13	63 ± 8

The current situation of Hubbard PR implementation in Hanoi and Da Nang

Like Fig. 1, the percentage of patients who were sub-clinically tested at CDDs before registering for Hubbard PR was low, about 35% for both cities, although there was a huge gap between this proportion of Da Nang (97%) and Hanoi (0%). Meanwhile, the pre-treatment assessment of clinical indicators showed that 100% of patients had their blood pressure, height, and weight measured during the classification step.

The results of implementing Hubbard PR from steps 2 to 4 from Table 2 showed that the proportion of patients exercised daily for at least 15–30 minutes (step 2); participates in sauna session for 2-4.5 hours (step 3); supplemented vitamins and minerals and complied with prescribed daily diet (step 4) were 92%, 85.3%, 100%, and 92%, respectively. At step 5 in the Hubbard PR process, we found that 79.9% of the patients received daily health examinations and counseling throughout the treatment.

Table 2

Patients' daily exercise, steaming, nutrition supplement, health examination, and counseling according to Hubbard PR process (step 2–5)

Indicator	Hanoi	Da Nang	Total
	n = 191, (%)	n = 108, %	n = 299, (%)
Patient exercised 15–30 minutes/day	94.2	88.0	92.0
Patient participated in all PR sessions 2,5–4 hours/day	86.4	83.3	85.3
Daily vitamin and mineral supplements	100.0	100.0	100.0
Adhere to daily doctor-prescribed diet	92.1	91.7	92.0
Daily health evaluation with counselling from HW	80.6	78.7	79.9

Figure 2 shown no patient was tested sub-clinically in this study after the treatment. Meanwhile, the majority of patients (at least nearly 82%) was tested clinically at the same time as blood pressure, weight, height measurement or cardiovascular, digestive, pulmonary symptoms evaluation.

Post-treatment follow-up results showed that the majority (91.3%) of patients participated in the full 21 days course of Hubbard PR treatment at 2 CDDs. This rate in Hanoi (~ 96%) was higher than that of Da Nang (83.3%). The percentage of patients who complied with the vitamin/mineral and diet recommendation after treatment was similar between Hanoi and Da Nang: 93.2% with 96.3% and 92.1% with 91.7%.

Treatment effectiveness of Hubbard PR with AO/dioxin victims

Regarding the effectiveness of Hubbard PR treatment, the results showed the proportion of patients with either dermatological, neurological, musculoskeletal, gastrointestinal, or cardiovascular disorders improved significantly after undergoing the treatment. The proportion of patients with neurological disorders or with musculoskeletal disorders reduced by about 20% at post-treatment time ($p < 0.001$, Chi-squared test). The proportion of patients with either cardiovascular, gastrointestinal, dermatological, or immunological disorders decreased by 15%, 10% ($p < 0.001$, Chi-squared test), 8%, and 5% ($p < 0.001$, Chi-squared test), respectively. Meanwhile, the proportion of patients with urinary disorders or with pulmonary disorders decreased by 2% and 3% respectively, showing reduction but remained statistically insignificant ($p > 0.05$, Chi-squared). The proportion of patients who did not see any changes or felt more tired after treatment was 13.7% (15.7% in Hanoi and 12% in Da Nang).

Table 3
Treatment effectiveness of Hubbard PR with victims of AO/dioxin

Patient group based on type of disorders	Pre-treatment	Post-treatment	P-value	Statistical test
Dermatological	8.4	0.3	0.01	Chi-Squared
Neurological	22.7	2.7	0.001	
Musculoskeletal	23.4	3.7	0.001	
Cardiovascular	18.7	4.0	0.001	
Pulmonary	5.0	1.7	0.06	
Immunological	8.7	3.7	0.01	
Gastrointestinal	10.7	1.0	0.001	
Urinary	3.0	1.3	0.17	

Challenges in implementation of Hubbard PR

Human resources

KII with CDDs' leaders and FGDs with HWs showed that the current human resources for Hubbard PR operation remained scarce "*At this center, there is only one doctor who is specialized in detox sauna, as well as first aid for patients should anything strange happen*" (KII01). The total number of HWs at both CDDs was 16, which was not sufficient. Therefore, one person had to be responsible for multiple positions during the treatment process "*The whole center has one doctor who's in charge of visiting and also case management, there's another healthcare worker who are in charge of nursing and accounting/admin*" (KII01) or "*The nurse here, on average, get 5–6 million VND/month. They are mostly contracted and have to take on multiple roles*" (KII01). This could be explained by the current benefits and salary, which were not appropriate for attracting high-quality personnel Meanwhile, at private practices and service providers, the benefits and salary were more well-received compared to that of the CDDs. Therefore, to ensure the appropriate human resources for the process, the CDDs need to have plans for additional hiring and improving the current benefits and salary for employees.

Regarding the quality of the human resources, the current state at the CDDs was not sufficient, as the CDDs had become operational for only a short amount of time, as well as some HWs lack work experiences or the lack of good benefits and salary package to attract high-quality professionals "*Ever since I come here to be the vice director of this center, there has been 3 general doctors who quitted due to dissatisfaction with their low pay*" (KII02). All of these contributed to a lack of high-quality professionals. Despite the lack of facilities, equipment, and human resources, the HWs were enthusiastic, passionate, and creative in their jobs "*One healthcare worker suggested that we should get equipment such as*

rehabilitation bikes for patients who can't run by themselves" (KII01). To improve the human resource quality, the CDDs should organize panel discussions on medical specializations between HWs from the CDDs and other facilities, inviting experts to work as consultants at the CDDs, improve the benefits/salary to attract high-quality professionals, and organize capacity building sessions for HW while encouraging HWs to self-learn and self-development their technical capacities "*At our center, every week, there's a debrief meeting and specialized communication session on different topics, each year we send officers who be trained at other detox center to keep them up to date and acquire new technology*" (KII02).

Facilities, equipment, and medical material

The initial facilities and equipment were sponsored by various funds to ensure the initial basic operation of the CDDs. However, each CDD needs to have a plan for maintenance that is suitable for the current situation, while developing a strategy for expansion to meet the increasing demand "*The centers don't have any annual repair or maintenance plan for the rooms and equipment, therefore the infrastructure here deteriorates further days by days, some equipment has not even been used once*" (KII01).

Financial factor

All CDDs depend on 2 main sources of funding, one from the Social Protection Centers of the Department of Labor, Invalids and Social of provinces/cities, and the other source from socialization, funded by businesses, organizations, and individuals' donations. However, this source of funding is often used for travel and allowance expenses of treatment participants. With such limited fundings, it is difficult to repair, maintain, and purchase new equipment, as well as attracting and fostering high-quality human resources "*With the great initial funding, the rooms and equipment can deteriorate over time, but the current funding is not enough to cover for the need of repairing and maintenance, not to mention purchasing new equipment*" (KII02 and FGD02). Therefore, the leaders of the CDDs have proposed to develop a plan to establish a branch for general population service, those who are not agent orange/dioxin victims (chemical poisoning, occupational hazards, heavy metal poisoning, heroin addiction...) to increase funding for each center

Technology application

The CDDs were not equipped with electronic medical records management software, so there were still many difficulties in managing and monitoring patients "*My center doesn't have electronic patient's record, so there are lots of difficulties in terms of patients management and monitoring*" (FGD02). Besides, there were not enough human resources to operate the system. Therefore, in the future, it is necessary to sufficiently secure human resources and electronic equipment

Management and related documents

The CDDs are under the provincial Association of Agent Orange Victims and operate based on the counseling of the Department of Health, following the guidelines of the City People's Committee. The CDD is responsible for performing steaming, detoxification, rehabilitation, and health improvement for victims of AO/dioxin and other poisoned patients. With such a structure, the CDD can easily update on

the policies, guidelines, and operating policies of the association as well as obtain the necessary information of the subjects involved in the detoxification. Strict organizational structure, units operating in one process under the direction of the Board of Directors leads to high professionalism and ease in implementing the PR process. Management efficiency was not optimal, due to the lack of human resources. The solution to overcome this is to develop recruitment plans and attract high-quality human resources “*Most of the detox centers don’t have a sufficient number of staff. Therefore, the management of the regulations implementation was ineffective and has much room for improvement*” (KII01 and FGD01). Although the CDDs had Hubbard PR implementation guidelines, the documents were not localized to be suitable with the current conditions of the CDDs. Therefore, the CDDs need to develop a set of instructions to suit the local conditions “Basically, the Hubbard PR process is rather straightforward and detailed. Despite that, since the documents are translated from foreign language ones, so when we implement the process, there can be some unclear content, for example, I think there needs to be a different set of criteria to more accurately determined patients’ stage of treatment in their 21-day process.” (FGD01).

Patient-related factors

The results of patient KIIs showed that patients were mainly introduced by health workers at the CDDs, and the level of knowledge about Hubbard PR was limited “*....this detox sauna process has 4 steps: 1 is measuring the blood pressure, weight, 2 is running, excercising, 3 is taking medications, 4 is sauna*” (Female 69), which may be due to the lack of promotion and publicity. In this regard, the CDDs should cooperate with the Central Association of Agent Orange/Dioxin Victims to introduce, advertise Hubbard PR using media (newspaper, radio, internet...), organize seminars and conferences for victims of agent orange/dioxin, and the community.

Most of the patients interviewed considered the Hubbard PR method as effective and suitable for agent orange/dioxin victims. The Hubbard PR method was developed based on the principle of detoxification through sweat, digestion, and urology while combining additional vitamins and minerals to improve health. Meanwhile, victims of AO/dioxin often suffer from chronic diseases that affect their health, so this method is very suitable for the subjects “*I have several chronic diseases: cardiovascular, diabetes, musculo-skeletal... I used to have sciatica, so painful that I couldn’t sleep, but after 10 days of sauna, I feel much better, sleep well at night...*” (Female 75 years old).

During the implementation of Hubbard PR, some advantages were the enthusiastic, thoughtful and creative attitude of HWs “*When we got into the sauna, there is always healthcare worker monitoring, if there’s anything not normal happen, they can intervene in time, so we feel really assured when we are on treatment*” (Male 76 years old). In addition, Hubbard PR was also trusted by the patient’s family members “*My wife persuade me to participate in this treatment cohort. I don’t like it myself. Each couple of days she comes by to check in with me and encouragement to complete the treatment, as recommended by the doctor*” (Male 72 years old). This was one of the advantages that helped patients and health workers share difficulties in the treatment process. In addition, several patients thought that Hubbard PR was quite simple and easy to implement.

However, there were still some difficulties in the process of Hubbard PR, such as excessive temperature, dose of drugs, and exercise “*...the sauna temperature of over 70 degrees makes me uncomfortable. The total length of treatment is 21 days, I think that's too long, I'm old, I don't have a lot to do. But each time there's any family business, it's hard for me to attend the treatment sessions continuously*” (KII with patients) or “*A handful of drugs each day makes me afraid*” (KII with patients). This may be because patients were mostly elders and were suffering from many associated chronic diseases. Therefore, the initial classification of health and development of the Hubbard PR for each subject is very important. In addition, some patients felt that the duration (21 days) was relatively long for them because, in addition to steaming, patients were also periodically examined for other chronic diseases (hypertension, diabetes mellitus, COPD ...); and patients found themselves feeling relatively well after about 10–14 days. Therefore, many patients suggested shortening the treatment time, to ensure continuous treatment.

Discussion

General descriptions of patients

Average age of respondents in the study was similar to that in studies conducted in Finland, Thai Binh province, or Ha Tinh province.^{4, 9, 15–16}. Regarding gender, 80% studied respondents were male. Similar proportions were found in studies conducted by the 103 Military Hospital (70% and 89%).⁷ Meanwhile, nearly 62% respondents had non-agricultural works and this result is smaller than that of a study conducted by Duong Quang Hien, with 91% of their patients were military officers and 9% were freelancers.⁸

The current state of Hubbard PR implementation in Hanoi and Da Nang

There was a huge difference in the proportion of patients who were sub-clinically tested before registering Hubbard PR treatment program between Hanoi (0%) and Da Nang (97.2%). This is because the CDD of Da Nang, while lacks a laboratory department, is located at the city's center, where patients have access to other medical facilities for testing. In Hanoi, the CDDs lack the personnel for the laboratory department. Thus, there is a need for human resources, along with additional equipment to implement the Hubbard PR process. However, 100% of patients had their blood pressure, height, and weight measured during the classification step. A similar result was found in the study of Nguyen Hoang Thanh, Duong Quang Hien, Tran Xuan Thu, and Pham Cong Nong.^{4,6–8} These were the minimum requirements to enrolled in Hubbard PR at our targeted service providers, which were easy to conduct.

The results of implementation in Hubbard PR from steps 2 to 4 was similar to a study in Thai Binh but was different compared to the findings from the studies of the Military Medical Academy.^{4,7} Also, patients participating in this study were asked to perform a 4-hour-a-day sauna session, with several cooling baths (every 3 minutes) or take a rest (5–20 minutes). Meanwhile, patients in the Military Medical Academy's study only participated in saunas for up to 25 minutes/session with no cooling break in

between.⁷ A review of different detoxification sauna/steaming methods showed that patients were asked to participate in a sauna with different durations, from 5–30 minutes/session or 30–240 minutes over several times [13]. Another study in the US showed that the duration of the patient's steaming sessions was 14.2 (\pm 7.5) minutes/session.¹² Therefore, in this study, there were 15% of patients who did not stay in the sauna for the whole duration, which may be due to the temperature of the Hubbard method was higher than that of the traditional method, along with the lack of awareness of patients regarding the treatment requirements and process. The studied result at step 5 was not found in the studies of Nguyen Hoang Thanh and Duong Quang Hien.^{7–8} Although in those studies, HWs did provide counseling and assessment of patients' conditions, this activity was not performed every day. The counseling time was too short to meet patients' expectations. This difference was due to each study's purposes. In this study, we were gauging the Hubbard PR compliance. Meanwhile, other studies were interested in the effectiveness of the detoxification steaming method, as shown in the changes of clinical biological indicators.

In this study, we found no patient was tested sub-clinically after the treatment program.

In contrast, this rate in the studies of 103 Military Hospital, Ha Tinh, and Thai Binh CDDs all reached 100%.^{4, 7, 9} This difference is because the other studies were designed to evaluate the effectiveness of their intervention, a specialized detoxification sauna method, or to monitor the long-term treatment effectiveness, so the authors focused on assessing the clinical indicators of patients before and after the treatment. Furthermore, the studies of 103 Military Hospital were conducted on small sample sizes (34 and 35 patients) and measured clinical indicators such as ALT enzyme activity, GGT, blood protein concentration.⁷ The study in Thai Binh was conducted on 820 patients treated with detoxification sauna in two years, each cohort consisted of 28–32 patients.⁴ However, this was a well-funded study to evaluate the therapeutic efficacy of the Hubbard PR method before further replication and expansion. Therefore, it is necessary during the classification step is to evaluate the clinical indicators before being enrolled in the treatment. Meanwhile, our study is a cross-sectional study that focused on record management of patients to evaluate the implementation of Hubbard PR. At Hanoi's CDD, the classification process considered patients' latest general health examination results as well. Therefore, almost all patients who were enrolled in Hubbard PR treatment during the first six months of the year were not clinically tested before enrollment.

The majority of patients (91.3%) engaged in the full 21 days course of Hubbard PR treatment. This may be due to the long duration of the procedure, causing several patients to become ineligible for the treatment. Therefore, it is necessary to optimize the duration of the treatment regimen to encourage patients' full participation, in addition to explaining to the patients about the treatment process. Similarly, at least 91% patients complied with the vitamin/mineral and diet recommendation after treatment. Adherence to nutrition regimens and gradual reduction of medication after treatment helps to enhance and maintain patients' health conditions after treatment. Nevertheless, we did not find the same results from studies of 103 Military Hospital, Ha Tinh, and Thai Binh CDDs as well as in Finland.

Treatment effectiveness of Hubbard PR with AO/dioxin victims

The effectiveness of Hubbard PR treatment in the study (Table 3) was similar to the results of Nguyen Xuan He: 92% of patients with cardiovascular diseases, 76% of patients with mental diseases/disorders saw improvement [9]. According to the Vietnam Association for Victims of Agent Orange's report in the Thai Binh province, symptoms that improved the most were: limb numbness, osteoarthritis pain, insomnia headache, and hypertension.⁴ The studied results also showed that nearly 14% patients who did not see any changes or felt more tired after treatment. This may be because the patients did not adhere to the nutrition and medication regimen, thus feeling tired while participating in the sauna. Therefore, it is necessary to strictly monitor and control the vitamins and minerals supplements and diet of patients, while developing a specific exercise regimen and diet suitable for each patient.

Conclusion And Recommendation

Regarding the implementation of Hubbard PR, although the CDDs and the majority of patients have followed the instructions, the proportions of patients receiving clinical tests before and after treatment were quite low (35% and 0%, respectively). The proportion of patients who did not participate in all PR sessions with a duration of 2-4.5 hours/day was 15%, nearly 20% of them were not evaluated by doctors using questionnaires after each day of treatment. In addition, nearly 20% of patients did not adhere to the six steps of the process. Meanwhile, the majority of patients complied with diet and vitamin supplements after the end of treatment 1 month. Regarding the effectiveness of Hubbard PR in improving clinical symptoms of patients, the proportion of patients with either neurological, musculoskeletal, cardiovascular, gastrointestinal, or immunological disorders reduced significantly, with the reduction ranging anywhere from 5–20% ($p < 0.01$). However, the Hubbard PR process did not show any effect on patients with urinary or pulmonary disorders.

During the implementation of Hubbard PR, CDDs faced up with barriers including inappropriate human resources, unattractive benefits, and salary, inappropriately designed and deteriorating saunas, inefficient use of equipment, or the lack of equipment for indoor exercise, or long time for drugs to transfer from the central to local branches. as well as lack of applying technology and electronic medical records management at the CDDs. In addition, there is currently no specific guideline issued by the MOH or the Provincial Department of Health to guide CDDs on how to implement Hubbard PR. For patients, there were also challenges, such as the lack of understanding of the treatment or patients not adhering to the treatment regimen. In addition, some other complaints were: PR temperature too hot (63%), long PR session duration (47%), too many medications taken during treatment (37%), and the cost of treatment is too expensive (35%).

To further improve the effectiveness of the treatment, the compliance of health workers and patients in CDDs with the implementation of Hubbard PR plays a central role. Therefore, for CDDs, they need to i) strengthen and reallocate human resources with expertise in physiotherapy, ii) plan for effective use of

equipment as well as additional indoor exercise equipment for the treatment regimen, iii) optimize the detox PR process, shortening the session duration, increase break duration with written instruction from MOH and Provincial Dept. of Health, iv) develop electronic medical record management software for ease of management and monitoring of patients' health, and v) perform clinical assessments of patients before and after treatment. For patients, it is necessary to communicate with them about the treatment and its benefits, adherence requirements of Hubbard PR before enrolling in treatment. Furthermore, there needs to be prospective cohort studies to evaluate the effectiveness of multiple treatment courses in a long-time span, as well as evaluating the effectiveness of the Hubbard PR process after patients finishing their treatment courses at CDDs.

Declarations

Ethical Approval and Consent to participate

The study was approved on ethical research by Institutional Review Board of Hanoi University of Public Health according approval code 019-291/DD-YTCC.

Consent for publication

NA

Availability of data and materials

The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request.

Competing interests

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Author Contributions

HDH conceived the ideas, collected the data, analyzed the data, and led the writing. While TNT supported data collection and writing report.

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Figures

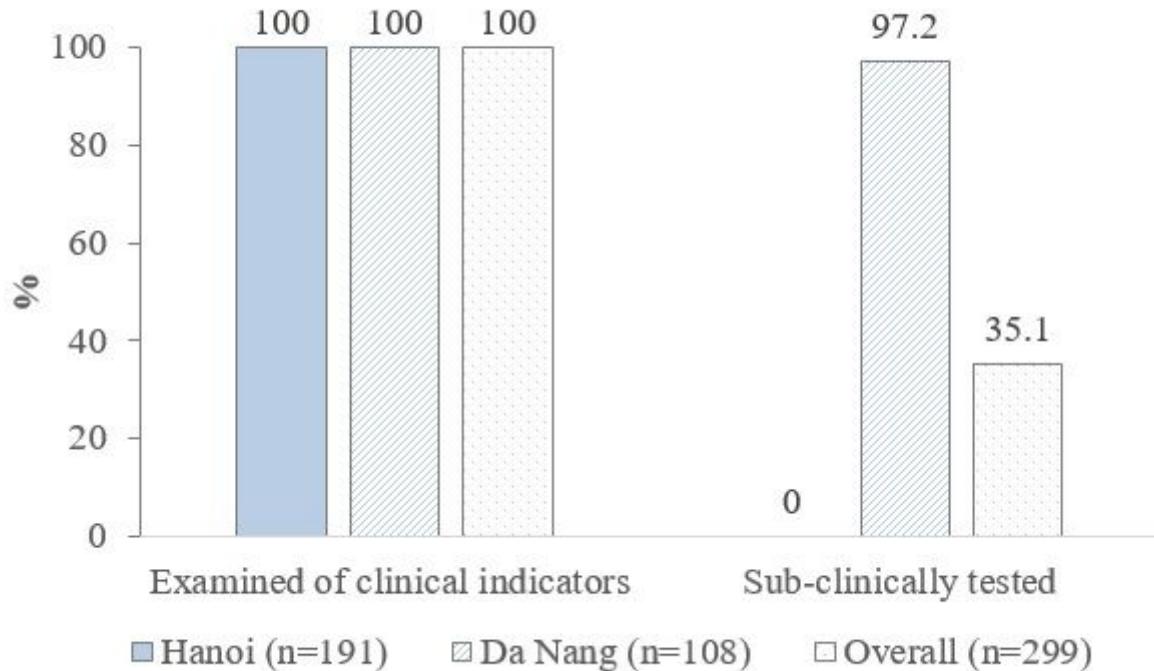


Figure 1

The proportion of patients examined clinically and sub-clinically before Hubbard PR registration (step 1)

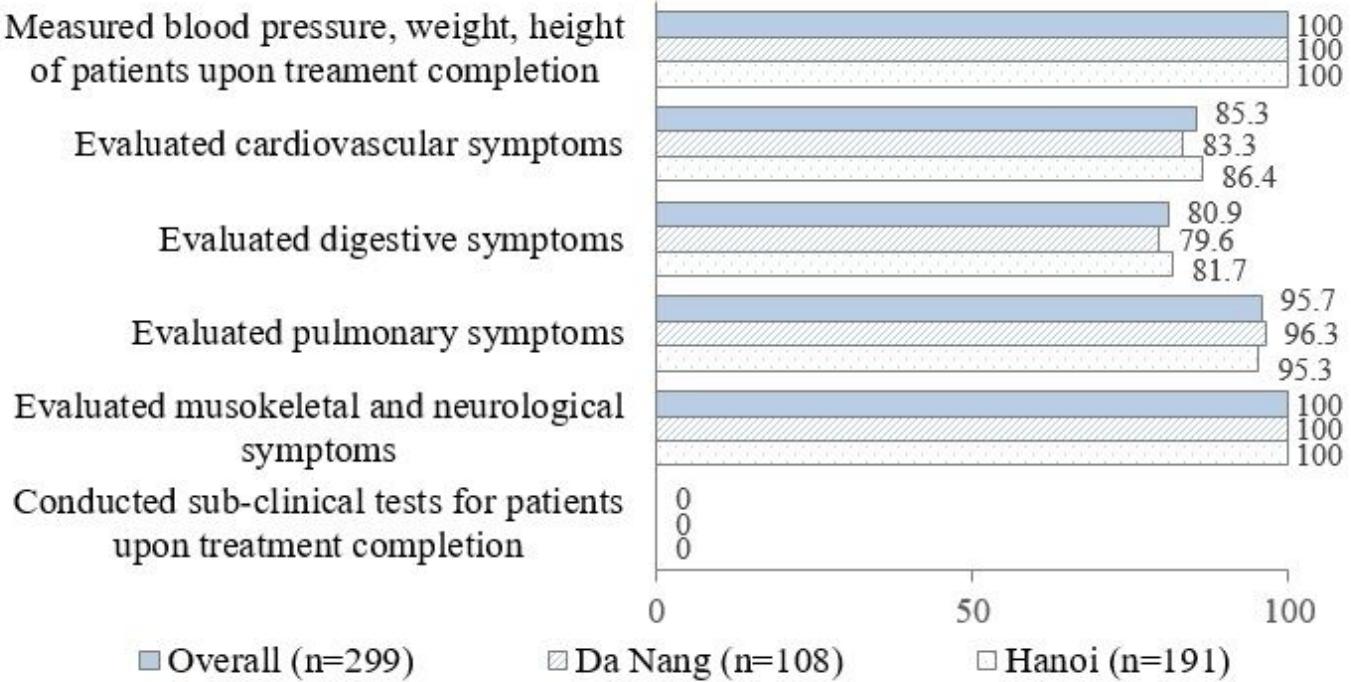


Figure 2

Clinical and sub-clinical evaluation during Hubbard PR of patients and after treatment ends (Step 6)

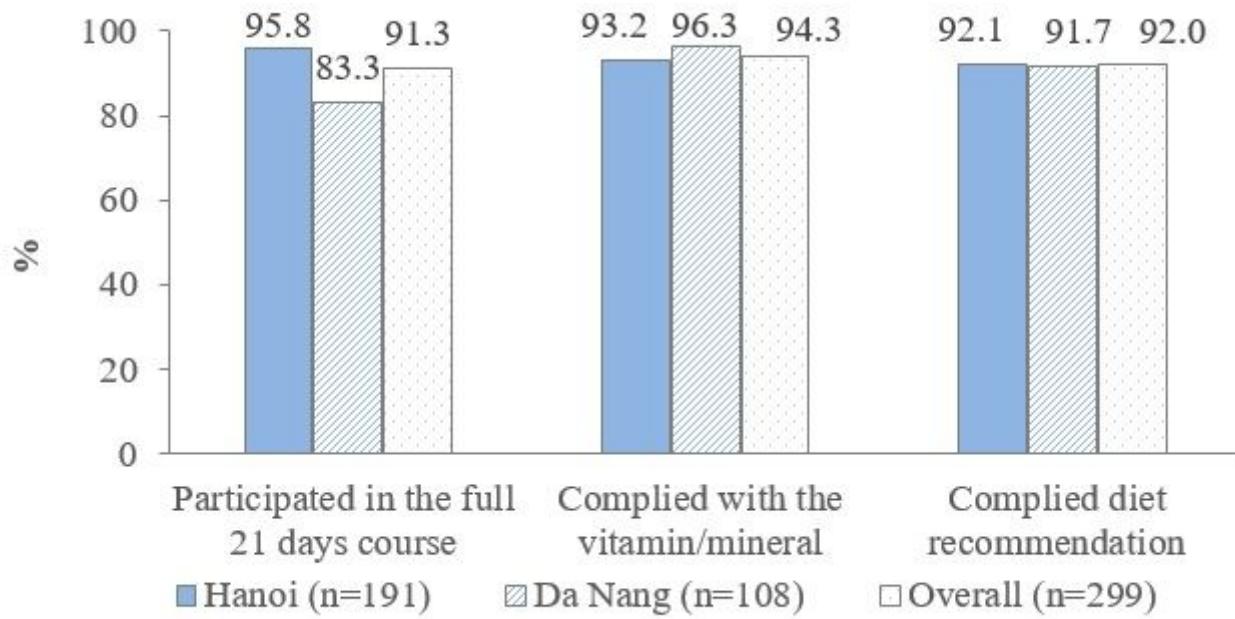


Figure 3

Follow-up on vitamin/mineral supplements and nutritious diet adherence of patients one month after the end of treatment