

〈教育報告〉

平成20年度専門課程Ⅱ

国際保健分野

Course Name: Master of Public Health in International Health

Effectiveness of Synthetic Opiate (Methadone) Treatment Program in Heroin Users in Jiangsu Province, China

Guohong CHEN

keywords: effectiveness, treatment, synthetic opiate, heroin users

Thesis Advisors: Takeo FUJIWARA, Tomoko KODAMA

Abstract

Introduction: Heroin users can be easily infected with HIV if they share syringes with other HIV-positive heroin users because the syringes are generally contaminated by blood that is sucked in during injection. Heroin addiction is a type of repeated brain disease. Clinically, long-term heroin use results in uncontrollable, rash, and compulsive behavior directed toward obtaining and taking heroin. One of the most effective treatments is the use of methadone as a replacement and supplement for the endogenous opiate. HIV transmission among heroin users has become a severe problem in China. Jiangsu Province is located in southeast China and has a relatively well-developed economy. Four methadone maintenance treatment (MMT) clinics were set up in February 2006 to treat heroin users in this area. This study was conducted to evaluate the effectiveness of MMT.

Objectives: To evaluate the effectiveness of a 1-year MMT in heroin users in Jiangsu Province with the aim of overcoming heroin use and prevention of blood-transmitted diseases, such as HIV, by sharing syringes.

Methods: This study was conducted in 4 MMT clinics in Jiangsu Province, China. Repeated cross-sectional surveys of the target population were conducted before and after they received at least 1 year of treatment in the MMT clinics. A questionnaire survey was implemented for all patients from March to April 2006 in the first survey ($n = 554$). The second survey was performed from August to September 2007 and was administered among those who received MMT for more than 1 year ($n = 804$). One hundred ninety-six patients who were investigated in both surveys were also evaluated for factors contributing to behavioral change. Data were analyzed statistically by χ^2 and Fisher's exact tests to examine the differences in social and behavioral characteristics between the first and second surveys. Multivariable logistic regression analysis was used to identify factors that affected changes in behavior related to heroin use, sexual intercourse, and social interactions.

Results: MMT helped to reduce the proportion of heroin use from 89.4% in the first survey to 14.1% in the second survey ($P < 0.001$) and decrease the sharing of syringes from 15.0% in the first survey to 3.6% in the second survey ($P < 0.001$). It also improved the social and family function from 48.0% in the first survey to 82.3% in the second survey ($P < 0.001$). Both male and female patients tended to have fewer sex partners after MMT treatment than before treatment ($P < 0.01$). However, the percentage of patients using condoms in the last sexual intercourse in the first survey was 25.5%, while that in the second survey was 25.9%, which was not significantly different over the course of 1 year ($P = 0.91$). With regard to antisocial behavior, the percentage of patients caught in illegal acts by the police in the last 3 months decreased from 19.1% in the first survey to 3.1% in the second survey ($P < 0.001$). Antisocial behavior, including theft, prostitution, and dealing in heroin, decreased after 1 year of treatment in the MMT clinics ($P < 0.05$). In the follow-up study of 196 patients who participated in both surveys, we could not identify any specific demographic variable that could be attributed to promoting the prevention of heroin use. Thus,

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MMT treatment appeared to be effective regardless of demographic variables, such as age, gender, and socioeconomic status. When the blood of patients was tested after 1 year of treatment, none of the subjects had seroconverted to HIV-positive.

Discussion and conclusion: MMT is effective in reducing heroin use and the sharing of syringes among heroin injectors, which decreases the risk of HIV transmission. Social and family relationships in patients were improved while antisocial behavior was decreased after 1 year of treatment at MMT clinics. The effects of MMT were independent of gender, age, marital status, or working status. It is suggested that the MMT platform in MMT clinics should be used to improve safe sex education.

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Course Name: Master of Public Health in International Health

Study on Japanese Infant Exposure to Furan

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keywords: Furan exposure, infant

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Abstract

Introduction: Furan was found unexpectedly in a number of foods when FDA scientists investigated irradiated foods. They identified furan in a number of foods that had undergone heat treatment, such as canned and jarred foods, including infant formulas and jarred baby food. Furan is considered a hazardous chemical and is classified as possibly carcinogenic in humans (Group 2B) by the International Agency for Research on Cancer (IARC). The furan intake of infants was found to be higher than that of adults, indicating higher risk. It is important to estimate the furan intake in the Japanese population, especially among infants, because furan levels in baby foods are a greater cause for concern than those in adult foods, as babies and infants may be more sensitive to furan exposure than adults. They also tend to consume more heat-processed foods than adults, including infant formulas, in proportion to their lower body weight.

Objective: This study was conducted to determine furan levels in commercial baby food to estimate the possible dietary intake of furan among Japanese infants and to evaluate the mutagenicity of furan.

Study Design and Methods: The study consisted of four parts: setting up a method of determination of furan by headspace GC/MS; testing samples for furan level using this method; estimation of furan exposure of infants from food; Ames assay to evaluate the mutagenicity of furan.

Results: The recovery rate was determined from 65.2% to 110.4%. The precision was evaluated by calculating the coefficient of variation (CV) based on four replicates with four samples, and the CV showed good reproducibility. In addition to the same levels of furan in jarred baby food already reported by other countries, some specialized Japanese food contains even higher levels of furan. A barley tea-based baby drink showed furan levels ten times higher than other drinks (two samples 27 μ g/kg and 39 μ g/kg, respectively), which is thought to be one of the major sources of furan intake. Japanese traditional baby food, which can be packaged in alumni-plastic bags or plastic boxes, contains even higher levels of furan, ranging from 5 to 76 μ g/kg. The percentile was used in estimating the dietary intake of furan as the distribution of infant food intake does not show a normal distribution. Using the highest furan level of standard baby food, the median dietary intake for a baby could be as high as 0.38 – 4.11 μ g/kg bw/day (90th percentile 0.75 – 5.73 μ g/kg bw/day) for different month age. Using the mean furan level of standard baby food, the median dietary intake for a baby is 0.24 – 2.33 μ g/kg bw/day (90th percentile 0.42 – 3.18 μ g/kg bw/day). The furan level of infant formula was low and can be neglected for estimation of exposure even using the highest level of 0.08 μ g/kg bw/day. On Ames assay, furan was negative in both TA98 and TA100 using two methods with and without S9 mix.

Discussion and conclusion: The results presented here indicted that furan could be found in a variety of commercial baby foods. The amount of furan detected in the sample foods varied from < 1 to 76 μ g/kg. On the other hand, furan level in infant

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formula appeared to be extremely low compared with other countries. Based on the data presented here, the estimation of mean exposure to furan for an average Japanese infant is about $1.52\mu\text{g}/\text{kg bw}/\text{day}$, under the assumption of extreme conditions. A no-observed-effect-level (NOEL) of 2 mg per kilogram of body weight in animal testing has been derived and there are no guidelines regarding tolerable daily intake (TDI) of furan; setting the safety factor to 100, the intake observed here is still safe. Four assumptions were used in estimation of exposure in this study: 1. Concentration of furan will be relatively stable within food package type; 2. Furan level will remain stable in the same food regardless of factory and lot number; 3. All intake in babies was due to commercial baby food; 4. All servings of commercially processed baby food were the average proportion of food. In addition, considering the high volatility of furan, actual intake level would be lower than those estimated in this study.

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Course Name: Master of Public Health in International Health

Prevention of Dengue Fever/Dengue Hemorrhagic Fever for Residents Living in Kaysone District, Savannakhet Province, Lao PDR

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keywords: dengue fever, prevention and control, knowledge, perception, behavior

Thesis Advisors: Yuriko DOI

Abstract

Background: Lao PDR is one of the countries where dengue fever and dengue hemorrhagic fever (DF/DHF) are serious health problems. The seasonality of DF/DHF cases with a rise at the beginning of the rainy season and outbreaks of DF/DHF with 1 – 2-year cycles have been reported since 1991. Since 1985, the epidemics of DF/DHF have increased, and at least six major different provinces in the country were affected by this disease between 1985 and 1987. In 1987, 9699 cases of DF/DHF were reported, of which 86% were in children under 15 years old and 295 resulted in death. Since 1994, DF/DHF has occurred every year in Lao PDR, and the number of provinces where dengue epidemics have occurred has increased from the northern part throughout the southern part of the country. At the same time, the disease has changed its pattern from an urban disease to a rural disease that will make disease control more complicated.

Objective: The present study was performed to measure the level of knowledge, perception, and preventive behaviors regarding DF/DHF, to compare knowledge, perception, and preventive behaviors regarding DF/DHF by family history of DF/DHF, and to examine the relationships of knowledge and perception with preventive behaviors regarding DF/DHF.

Study Design: A cross-sectional study.

Materials and Methods: The study was conducted in June 2008 among 405 housewives and heads per household selected randomly from 15 villages of Kaysone District in Savannakhet Province, Lao PDR. The data were collected through an interview using a structured questionnaire. The questionnaire consisted of four parts: sociodemographic characteristics of respondents; knowledge regarding prevention and control, including knowledge of mode of transmission, breeding sites, and sources of DF/DHF information; perception of disease and preventive behaviors of DF/DHF; experience with preventive behaviors, *i.e.*, individual-level prevention of being bitten by mosquitoes, breeding of mosquitoes in water containers, and proper treatment of unused water containers, as well as participation in community-based activities to control DF. The χ^2 test was used to compare knowledge, perception, and preventive behaviors between two groups with and without a family history of DF. Multiple logistic regression analyses were performed to evaluate the associations of knowledge and perception with preventive behaviors on DF. The scores of knowledge and perception were standardized over a range of 0 – 5 points.

Results: All of 405 subjects included in the study participated in the survey (response rate: 100%). Most subjects were female (76.8%), 15 – 54 years old (95.1%), and had completed primary or secondary school (77.6%). There was a family history of DF/DHF (FH) in 35.6% among the subjects. The percentages of households with and without FH visited by health officers during the last 3 months were 47.2% and 39%, respectively. Over half of the housewives and heads of households (59% and 49% for those with and without FH, respectively) were aware that mosquito vectors rest at the light and airy indoor places. The percentage of correct responses to the question regarding whether DF occurred only in the rainy season was the lowest (9.9%): 13.2% and 8.0% for those with and without FH, respectively. Less than half of the subjects gave the correct response that

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Aedes mosquitoes do not usually inhabit and breed around lakes or rivers: 29.9% and 44.8% for those with and without FH, respectively ($P = 0.004$). One fifth agreed that DF could only attack children: 25% and 20.7% for those with and without FH, respectively. About half agreed that DF patients who were treated completely could not be infected again: 57.3% and 55.9% for those with and without FH, respectively. Some perceived that drums were too large to clean every week: 41% and 28% for those with and without FH, respectively ($P = 0.011$). Both groups expected health officers to come to the villages to kill and destroy larvae: 86.1% and 64.8% for those with and without FH, respectively ($P = 0.001$). The percentages of 12 preventive behaviors were as follows: using a net (79.8%), fan (71.4%), insect repellent lotion (28.4%), and anti-mosquito spray (25.9%); changing water every week (87.4%), using covers (41.5%) and temephos (Abate) emulsions (40.7%); incinerating unused water containers (64.4%), using public waste management (64.0%), and putting waste in a hole with a cover (39.3%); participating in clean-up days (89.1%) and village meetings (65.7%). These behaviors were significantly associated with knowledge and perception regarding DF/DHF after adjusting for FH and sociodemographic factors.

Conclusion: In conclusion, most of the residents had correct knowledge regarding DF/DHF, except that DF/DHF can occur all year around. This indicates that health officers and health workers should educate and encourage people to keep taking preventive measures against DF/DHF even during the dry season. Second, almost all of the respondents perceive DF as a serious disease regardless of their family history, but those with a family history were overly nervous about DF/DHF. These observations are encouraging, as they suggest that the subjects are concerned about DF/DHF and are prepared to take preventive measures. Most of the subjects were fully aware that younger children are more susceptible to DF/DHF, and tend to take care to avoid infection. On the other hand, they erroneously perceived that healthy adults cannot be infected with dengue virus. Health officers and health workers should correct this perception regarding disease susceptibility. Finally, some preventive behaviors (*e.g.*, using repellent lotion, anti-mosquito spray, covering water containers and temephos (Abate) emulsions, and participating in village meetings) are not practiced sufficiently among the respondents. Health officers and health workers should focus on these behaviors within the community for disease prevention.

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国際保健分野

Course Name: Master of Public Health in International Health

Factors Affecting Infant Feeding Decisions Among HIV-Infected Women in Selected Parts of Tanzania

Michael MSANGI

keywords: HIV, mother-to-child transmission, prevention, infant feeding, resource limited settings

Thesis Advisors: Tomoko KODAMA, Yuichiro YAHATA

Abstract

Introduction

Selection of infant feeding options among HIV-infected mothers has been a great challenge in prevention of mother-to-child transmission (PMTCT) in Tanzania. Without any interventions to PMTCT, the overall risk is 40%. Therefore, the WHO has proposed guidelines for modification of infant feeding practices to reduce or prevent mother-to-child transmission of HIV. The risk of mother-to-child transmission during breastfeeding is 5% – 10% in Tanzania.

Objective

This study was performed to examine the factors influencing infant feeding choices among HIV-positive mothers at Reproductive and Child Health clinics in Iringa, Mtwara and Kilimanjaro regions of Tanzania.

Methodology

A cross-sectional analysis was conducted among 306 pregnant mothers who took part in a National PMTCT study from July 2006 to August 2007. Of these, 273 were found to be infected with HIV, and the remaining 33 pregnant women were excluded from the analysis.

Inclusion criteria were HIV-positive pregnant mothers from 34 weeks of gestation followed-up through delivery up to three months post delivery ($n = 273$ mother/infant pairs).

HIV tests for babies were performed using HIV-1 DNA PCR within 48 h of birth and at 3 months of age. Data were collected by healthcare workers at Reproductive and Child Health (RCH) clinics, based on the questionnaire developed by the PMTCT Program of the Ministry of Health and Social Welfare (MOHSW), by asking about infant feeding practices of mothers for the three months after delivery and their social demographic factors.

Logistic regression model was performed to determine the odds ratio and 95% confidence interval (95% CI) of infant feeding choice as dependent variables and sociodemographic factors, knowledge (PMTCT, infant feeding options, FP), social stigma, and partner support as independent variables.

Results

The mean age \pm SD of the mothers was 27.4 ± 5.8 . The age group most affected was 25 – 34 years (56.0%; $n = 153$). Of the 273 pregnant women, 87.2% ($n = 234$) chose to breastfeed exclusively, whereas 8.8% ($n = 24$) practiced mixed feeding. Four percent ($n = 11$) practiced replacement feeding, which is regarded as a feeding method with no risk of HIV infection to the baby from

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the mother. The main finding of the present study was a strong association between choice of infant feeding method and availability of information on infant feeding options (OR = 4.58; 95% CI = 1.27 – 16.7; $p = 0.032$). The associations between infant feeding choice and sociodemographic factors, such as mother's age, occupation, marital status, and level of education, were not significant. Other factors with associations that were not significant were knowledge regarding MTCT (OR = 0.73; 95% CI = 0.18 – 2.82; $p = 0.755$), disclosure to partner (which signifies a low level of stigma and increased chances of external support) (OR = 1.91; 95% CI = 0.40 – 9.03; $p = 0.517$), and total family income (OR = 0.87; 95% CI = 0.11 – 7.06; $p = 0.982$).

However, the HIV infection rates among children were 5% at 48 h and 4% at 3 months using HIV PCR test.

Discussion and Conclusion

The significant association between the infant feeding choice made by mothers and infant feeding information given to mothers indicated that information on infant feeding is the basis by which women infected with HIV make an informed choice regarding infant feeding options to prevent transmission of the virus to their babies. In this study, mothers who were knowledgeable regarding infant feeding options chose breastfeeding to feed their babies. This could have been because they were able to balance the risk of HIV transmission through breastfeeding and morbidity and deaths resulting from other illnesses, such as diarrhea and malnutrition. It is also possible that the influence of the national policy on infant feeding in the context of HIV also played a part. The policy recommends replacement feeding to HIV-infected mothers only if it is acceptable, feasible, affordable, safe, and sustainable (AFASS). The analysis indicated that the HIV transmission rates to babies at 48 h and 3 months were 5% and 4%, respectively, reflecting transmission during labor and delivery, which was lower than the estimated rate of 20% with NVP prophylaxis. This probably reflects effective interventions applied by the program, although it is not yet possible to come to definitive conclusions in this regard. The significant relation between replacement feeding and HIV-negative status of the babies at 3 months ($p = 0.024$) indicated that those babies whose mothers had chosen replacement feeding were free of HIV infection at 3 months. However, this may have resulted in overestimation due to the small number of babies tested at this age.

The limitations of the study were the small sample size of mothers that may have caused over- or underestimation of the results, poor postnatal follow-up, which led to few HIV-exposed babies being tested for HIV, and constrained logistics of transporting blood samples to the testing center rendered some specimens invalid for testing (*e.g.*, samples were clotted, *etc.*). Another limitation was recall bias by the mothers when asked to recall their feeding practice for the past three months.

In conclusion, information on infant feeding options is strongly associated with the choice of infant feeding options by HIV-infected pregnant and lactating mothers. Methods to strengthen and support the decision making process should be put in place. This will enable mothers to make informed choices and understand the importance of adhering to the feeding choice to prevent MTCT. Other factors such as information regarding MTCT, disclosure to partner, social stigma, maternal age, marital status, occupation, and income did not strongly influence the decisions regarding infant feeding options.

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Course Name: Master of Public Health in International Health

Developing Effective Hepatitis B Control Programs in Pacific Island Countries: A Literature Review

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keywords: Hepatitis B, perinatal transmission, Hepatitis B birth dose, Hepatitis B immunoglobulin, effective control programs, Pacific Island Countries

Thesis Advisors: Hidemi TAKIMOTO

Abstract

Objectives: The general objective of this study was to determine effective measures for prevention of perinatal transmission of hepatitis B. The specific objectives were: a) to determine effective strategies for implementing the vaccine birth dose; b) to find effective immunization regimens for prevention of perinatal transmission; and c) to determine how these strategies can be applied to Pacific Island countries.

Methodology: A literature review was performed using the PubMed database with the following search key words: a) hepatitis B (MeSH) AND prevention of perinatal transmission; and b) hepatitis B vaccine (MeSH) AND birth dose. Study selection criteria were: a) all infants, birth to 23 months; b) all children, 0 - 18 years; c) published in the last 10 years; and d) English language. Final selection was performed by reading and selecting the relevant articles. From 393 articles that matched the search criteria, 12 were selected for this study. Data extraction was based on two categories: a) intervention strategies for achieving high coverage of birth dose, full immunization schedule, addition of hepatitis B immunoglobulin and/or a booster dose; and b) outcome in coverage rates, hepatitis B surface antigen prevalence, and anti-hepatitis B antibody levels. Analysis was performed using a matrix to compare four intervention strategies: a) implementation of hepatitis B immunization schedule (including birth dose), b) addition of immunoglobulin vaccination, c) giving HBIG without HB at birth, and d) addition of a booster dose. The effectiveness of each of these strategies was assessed according to outcome in terms of three measures: a) coverage rate, b) hepatitis B surface antigen prevalence, and c) anti-hepatitis B antibody levels.

Results: Five studies on implementing hepatitis B immunization schedules showed improvements in all groups, but even better outcome for children in urban areas, born in hospital, or with use of Uniject, pre-filled single-dose, outside the cold chain preparations for home births in rural areas. Three studies on addition of immunoglobulin vaccination at birth demonstrated added value, although proper implementation of hepatitis B immunization schedule alone also showed a similar outcome. Two studies on giving HBIG only at birth showed an effective outcome in terms of protective antibody levels for one, but not in the other. Two studies on addition of a booster dose showed effective outcome when boosted at 10 - 11 years of age, but lower when boosted at 14 - 16 years of age. Better outcome also resulted when there were detectable levels of anti-hepatitis B antibodies prior to boosting.

Conclusion: Special strategies including user-friendly vaccine preparations and involvement of village health workers increase the chances of a timely (24-h) HB birth-dose, while maintaining vaccine quality and improving cost-effectiveness. These are

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important for hospital and home births, as well as for urban and rural areas. Specific program strengthening is required to increase coverage of additional HB doses. Adding hepatitis B immunoglobulin vaccine at birth adds significant value, but only where feasible. A booster dose in older children can significantly increase an immune response to protective levels.

Recommendations: a) Consider use of Uniject, prefilled OCC vaccine preparations, and assistance from village health workers or traditional birth attendants to achieve timely HB birth dose where cold chain support is weak or absent. b) There is an urgent need for further program strengthening. c) Consider addition of HBIG for babies of seropositive mothers in countries and areas with adequate health systems, immunization programs, and resources. d) Further studies in PICs on effective strategies for controlling HB infections are required, based on the above points (a) to (c).

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国際保健分野

Course Name: Master of Public Health in International Health

Effectiveness of Participatory Training in Improving Knowledge and Skills on Laboratory Technicians on Direct Sputum Smear Microscopy in Central Luzon, the Philippines

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keywords: direct sputum smear microscopy, acid fast Bacilli (AFB), tuberculosis, training, TB laboratory

Thesis Advisors: Nobuyuki HYOI, Shoichi ENDO

Abstract

Background and Objective:

Basic sputum microscopy training (BSMT) is a capacity-building activity to enhance competency of laboratory personnel in the performance of direct sputum smear microscopy (DSSM), which is the primary diagnostic tool of the National Tuberculosis Control Program (NTP) in the Philippines to detect infectious tuberculosis (TB). There is currently no comprehensive evaluation of BSMT in the Philippines. The main objective of this study was to assess and document the effectiveness of participatory training methods in improving the knowledge and skills of laboratory personnel on DSSM, in view of strengthening laboratory services for NTP. Specifically, the study was performed to evaluate three components of training: namely written examinations for the assessment of knowledge; and microscopy reading proficiency and smear preparation for assessment of skill and measurement of output. Moreover, related factors associated with effective training were also examined.

Study Design and Methods:

This was an intervention study, comparing the performance of the same group of trainees “before” and “after” training. The intervention was a five-day training course applying the curriculum design specified in the Acid Fast Bacilli (AFB) Microscopy Training manual. This study utilized data from three batches of BSMT conducted by the Regional TB Reference Laboratory (RTRL) of Central Luzon, the Philippines, in 2006. Twenty-three laboratory personnel working for NTP in various health facilities within the region were included in this study.

The study involved pre- and postevaluation of performance on microscopy reading proficiency, smear preparation, and written examination. The national External Quality Assessment (EQA) manual stipulates the following indicators of laboratory performance: occurrence of major and minor errors in reading; and proportion of good quality smears in terms of specimen quality, staining, cleanliness, thickness, size, and evenness. Based on these guidelines, the aforementioned measures were adopted to assess training output. Moreover, additional relevant indicators, such as sensitivity and specificity, were utilized for more in-depth evaluation. Hence, for microscopy reading proficiency, the measures utilized were interobserver agreement, sensitivity, specificity, total errors, particularly major and minor errors; of which three sets of practices composed of a total panel of 230 slides per practice were analyzed using proportions and actual counts. For smear preparation, the measures were: proportion of “good” points on specimen quality, staining, cleanliness, thickness, size, and evenness; of which four sets of

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practices consisting of a combined total of 230 smears per practice were evaluated. For written examination, pre- and posttest scores were utilized. Course evaluation results were also utilized to supplement the findings of this study. Furthermore, certain background characteristics of the participants, such as age, designation, workplace, length of service, and province, were cross-tabulated with relevant indicators to determine whether these were factors contributing to performance. Nonparametric statistical analyses were applied to test for differences and inter-observer agreement was examined using kappa statistics. Statistical significance for all analyses was set at 5% and calculated using Excel and SPSS 15.0.

Results and Discussion:

The findings demonstrated improved microscopy reading proficiency from baseline practice (first) to last practice (third), as evidenced by a significant increase in sensitivity from 83.5% to 92.2% ($P = 0.032$); specificity was maintained at a high level of 99.1%; higher posttraining kappa values were observed in 14 (60.9%) trainees from a baseline of 7 (30.4%); significant decreases were observed in the number of total errors (TE) (from 21 to 10; $P = 0.035$) and major errors (from 5 to 0; $P = 0.025$), all of which were high false negatives (HFN). A decrease was also observed in minor errors (from 16 to 10), all of which were low false negatives (LFN), but this was not statistically significant. The results of the second practice were as follows: sensitivity, 92.2%; specificity, 97.4%; TEs, 13 (of which 3 were major errors and 10 were minor errors). All major errors were HFNs, while minor errors consisted of six LFNs, three low false positives and one quantification error. Comparison of mean differences in the results from second to last practice were not significant in any of the measures. However, at second practice, major errors were still noted, which were later eliminated at the last practice. These observations indicated that improvement from second to third practice did not make considerable differences in any of the indicators except elimination of major errors.

Smear preparation technique also improved, as shown by the increase in the mean proportion of “good” points from baseline practice (first) to last practice (fourth) on specimen quality from 63.5% to 100% ($P = 0.001$), staining from 59.1% to 100% ($P = 0.001$), cleanliness from 83% to 100% ($P = 0.059$), thickness from 53% to 100% ($P < 0.001$), size from 31.7% to 98.2% ($P < 0.001$), and evenness from 16% to 98.2% ($P < 0.001$); of these, only cleanliness was not significant. The improvement from third to fourth practice indicated the following differences in mean proportions between the two practices: staining = 1.3%, thickness = 3.9%, size = 0.4%, and evenness = 0.8%. No differences were observed for specimen quality or cleanliness. These differences were not significant in any of the categories, suggesting that the degree of improvement from third to fourth practice was negligible.

The training also strengthened the knowledge of trainees regarding DSSM as indicated by the apparent improvement of test scores from an average of 51% at baseline to a posttraining score of 87.6% ($P < 0.001$). More specifically, they showed marked improvements in theoretical and practical knowledge through provision of standardized lectures.

In this study, age, designation, workplace, length of service, and province were determined not to be predictors of performance in any of the training components. However, as the data were limited, it was not possible to draw any definitive conclusions regarding associations.

The course evaluation results indicated that BSMT was generally effective in fulfilling overall technical and administrative aspects of the training as reflected by the completely satisfactory rating of “5” given by 60% (13) of the participants and a satisfactory rating of “4” given by 27% (6) of the participants.

Taken together, these analyses indicated that BSMT was successful in enhancing the knowledge and skills of trainees regarding DSSM. More importantly, these findings also reflect the effectiveness of the methods applied in BSMT to facilitate tangible improvement in the participants’ competency. Therefore, it should be emphasized that feedback, being the principal intervention mechanism applied in all technical components of training, is the key factor for effective BSMT.

Conclusion:

This study indicated the effectiveness of BSMT in improving the competency of trainees on DSSM through comprehensive evaluation of training output. The participatory oriented approach of the training was shown to be workable and effective. Therefore, this study strongly supported the adoption of the methods contained in the AFB Microscopy Training manual. In

addition, three sets of microscopy readings and smear preparation practice sessions were determined to be the minimum number required to attain acceptable performance on DSSM. Finally, strengthening the capacity of regional TB reference laboratories for training, along with EQA efforts, should be considered as an important aspect of an effective TB control strategy for NTP.

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国際保健分野

Course Name: Master of Public Health in International Health

An Analysis of the Factors Affecting the Motivation of Village Health Workers in Vietnam

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Keywords: job satisfaction, motivation, village health workers, community, Vietnam

Thesis Advisors: Noriko KATO

Abstract

Background: Village health workers (VHWs) play an essential role in the healthcare system of Vietnam. They work on a volunteer basis and are selected by a community to act as a gateway to essential healthcare services. Previous studies have indicated that having capable and motivated health workers is the key to achieving national health goals. However, there have been few studies focusing on the motivation of VHWs, who are the health workforce at the most peripheral level of the healthcare system in Vietnam. The objectives of this study were as follows: 1) to develop a measurement of motivational status of VHWs; 2) to determine which factors are significant determinants of motivation; and 3) to suggest ways to improve the motivation of VHWs.

Methods: A cross-sectional study was carried out among 74 VHWs in Hoa Bin Province, in northwestern Vietnam. The data for this study were obtained from self-administered questionnaires through central location tests (CLT) at community health centers. To examine the relationship between motivation and various factors, 1) job satisfaction was measured as an alternative indicator of motivation using the Warr-Cook-Wall scale, and nine aspects of work were assessed on a seven-point scale; 2) five factors that affect motivation were assessed using the model of Bhattacharra *et al.*; and 3) simple and multiple regression analyses were performed between the total scores of the nine aspects of work (“total job satisfaction”), which was defined as a dependent variable, and the five factors that affect motivation, which were defined as independent variables. This is the first study in Vietnam utilizing quantitative analysis of the factors that affect motivation with the model of Bhattacharra *et al.*

Results: The respondents (men: 14; women: 60) were most satisfied with their “colleagues and fellow workers” (mean \pm SD: 6.5 ± 1.1), followed by their “freedom to choose their own method of working” (5.9 ± 1.7) and the “recognition they received after good work” (5.7 ± 1.5). They were least satisfied with their remuneration (1.6 ± 1.2). There was a significant difference in the mean score of “total job satisfaction” according to “educational level” ($P = 0.037$) and “the number of years of experience working as a VHW” (0.044). The results indicated that “total job satisfaction” (motivation) was significantly related to three factors: 1) monetary factors that motivate VHWs ($P = 0.003$); 2) factors that motivate communities to support and sustain VHWs ($P = 0.035$); and 3) factors that motivate MOH staff to support and sustain VHWs ($P = 0.041$). On the other hand, the “non-monetary factors that motivate VHWs” and “community factors that motivate VHWs” were not significantly related with “total job satisfaction” (motivation) in this study. However, the findings indicated that these could be indirect reinforcing factors of motivation as they were strongly linked with the “factors that motivate communities to support and sustain VHWs” ($P < 0.01$).

Conclusion: Monetary factors showed the strongest correlation with “total job satisfaction” (motivation) in this study. However, the results indicated that non-monetary factors and community factors may also contribute indirectly to “total job satisfaction” (motivation). Therefore, appropriate interventions should also address these factors to attain high motivation of

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VHWs. Their high motivation could be further achieved: 1) by enhancing the health system so that it can support the work of VHWs financially and institutionally (*e.g.*, allocating resources and materials so that VHWs can work in a professional manner, conducting regular supervision, establishing a performance appraisal system); 2) by strengthening working relationships between VHWs and their community (*e.g.*, strengthening community involvement in the selection of VHWs and evaluation of their work) ; and 3) by providing opportunities for the training and professional development of VHWs.

〈教育報告〉

平成20年度専門課程Ⅱ

国際保健分野

Course Name: Master of Public Health in International Health

Analysis of Factors Related to Success of Private-Public Mix DOTS

Hiromi SUWA

keywords: public-private mix, DOTS, tuberculosis, detection rate, treatment success, equity in access

Thesis Advisors: Tomoko TACHIBANA, Toru MORI

Abstract

Background:

Tuberculosis (TB) is still a major cause of illness and death worldwide, especially in Asia and Africa. Globally, 9.2 million new cases and 1.7 million deaths from TB occurred in 2006. Public-private mix (PPM) is a World Health Organization (WHO) recommended strategy by linking all healthcare entities within the private and public sectors to the National TB Program (NTP) for expansion of Directly Observed Treatment Short-course (DOTS) activities. DOTS is an internationally accepted strategy for tuberculosis (TB) control. Several countries have already begun involving different categories of health care providers in TB control. Experience from these projects may be useful for understanding how to develop, introduce, and expand PPM DOTS, involving the private sector in NTP.

Objective:

The objective of this study is to develop a basic model of a successful PPM with necessary conditions and modes of implementation, by comparing the processes and outcomes of the PPM projects already under progress, in developing countries.

Method:

“Cross-project analysis” was employed. As the first step, the PPM performance was determined by monitoring the PPM implementation process and the quality of treatment within the respective PPM projects. The variations in TB control impacts and PPM performances across projects were observed in structural conditions and in operational intervention strategies for PPM to understand their public health effects and collaboration arrangements. Finally, TB control impacts were measured by indicators of case detection, treatment outcome and equity in access.

[Results]

PPM performance: With the exception of those in Ho Chi Minh, private providers in these projects were mostly trained and instructed to follow the standard procedures for diagnosis, treatment, monitoring, and defaulter tracing in accordance with the respective national guidelines. Structural conditions: No new legislations or formal policies regarding the involvement of private practitioners (PPs) in TB control were introduced in any projects. Thirteen projects received high-level government support. The projects were funded by governments and external organizations. NTPs of most projects provided mainly drugs, sputum cups, and treatment cards to be used in the facilities belonging to the private sector. Twelve projects had active dialogue among stakeholders. Strategies for intervention: Strategies were adopted in all except two projects in Vietnam, where free drugs were not provided but financial incentives were used. Impact of the projects: The proportion of new sputum smear-

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positive (NSS+) cases among all the registered cases in a PPM project, either treated by private providers or referred to the national TB program (NTP), ranged from 27% to 75%. In seven projects, there was an increase in case detection varying from 9% to 36%. The treatment success rate for NSS+ cases, treated in accordance with the DOTS strategy including NTP treatment regimen and sputum microscopy for diagnosis and monitoring, ranged from 50% to 92%. Two Ho Chi Minh projects, which exceptionally did not use the direct observation of drug taking (DOT), were rated at 50% and 60%, respectively. The defaulter rate of NSS+ cases ranged from 5% to 37% in 11 projects. Twelve projects made quality treatment by PPs available so that the anti-TB drugs could be dispensed free of charge to people with middle and low income. In Ho Chi Minh, patients had to pay for drugs.

Discussion and Conclusion:

These intervention projects showed that working collaboration can be established between private and public sectors in low- and middle-income countries with a high TB burden. The PPs together can contribute to improvement in case detection, achieving acceptable treatment results and providing affordable treatment of high quality to those in lower socioeconomic positions. Three potential success factors should be considered when moving from a pilot project to a nationwide routine program: 1) new legislation, 2) dialogue between stakeholders in the structural condition, and 3) provision of free drugs in the intervention package, both backed by the strong commitments of the government when planning PPM for improved TB control.

〈教育報告〉

平成20年度専門課程Ⅱ

国際保健分野

Course Name: Master of Public Health in International Health

Evaluation of the Peer Education Program in the Central Region of Vietnam

Miwa HAYASHI

keywords: HIV/AIDS, peer education, Vietnam, prevention, evaluation

Thesis Advisors: Takeo FUJIWARA, Tomoko KODAMA

Abstract

Background: The HIV epidemic is still in the concentrated phase, with a significant prevalence among groups that are most at risk of HIV, such as injection drug users (IDUs), female sex workers (FSWs), and men who have sex with men (MSM) in Vietnam. The peer education program has been employed as one of the strategies for HIV prevention to approach those groups that are most at risk of HIV in Vietnam.

Objectives: To evaluate the effectiveness of the peer education program, which aims to prevent the spread of HIV/AIDS in the central region of Vietnam.

Methods: This was a comparative study on the incidence of HIV in the entire population from 2000 to 2006 involving the nine provinces of the central region of Vietnam, where the peer education program was or was not implemented. The Time-series Poisson analysis was used to compare the trend of HIV incidence before (2000 - 2003) and after (2004 - 2006) the initiation of the peer education program in four provinces that actively implemented peer education programs and five provinces that did not implement such programs.

Results: The before-to-after peer education incidence rate ratio (IRR) of HIV incidence among the provinces that actively implemented peer education programs was 1.74 (95% CI = 1.60 - 1.86), while that among provinces that did not implement peer education programs was 1.86 (95% CI = 1.63 - 2.13). The relative incidence rate ratio was 0.93 (95% CI = 0.83 - 1.05).

Discussion and Conclusion:

The peer education program was not effective in reducing the trend of the incidence rate of new case of HIV infection in the central region of Vietnam. However, the point estimate suggested a weak protective effect of peer education on the trend in the incidence rate of HIV. Further improvements in peer education programs, including their coverage and community-based approaches, are recommended to address the HIV/AIDS epidemic in Vietnam.

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〈教育報告〉

平成20年度専門課程Ⅱ

国際保健分野

Course Name: Master of Public Health in International Health

Underweight Children and Mothers' Perception of Parenting Circumstances in Urban-slum Area, Barisal, Bangladesh

Yoko FUJITA

keywords: underweight, parenting, mothers' perception, social support, Bangladesh

Thesis Advisors: Tomofumi SONE, Yasuo TANAKA

Abstract

Objectives:

Bangladesh has made remarkable progress in primary health care for children over the past several decades. However, the under-five mortality rate, 69 per 1000 live births, and the prevalence of underweight children, 48%, are the highest among South Asian countries (UNICEF, 2008). Further reduction of the rate of malnutrition among children is a high priority to achieve the Millennium Development Goals 4 in Bangladesh. Characteristics of maternal parenting, such as awareness of child's health problems and health-seeking behaviors, are important determinants of child survival. This study was performed to investigate the child nutritional status and mothers' parenting circumstances in three residential areas, and to identify associated factors leading to child malnutrition in Barisal, Bangladesh.

Study design and Methods:

This cross-sectional study was carried out in Barisal Sadar Upazila, which was struck by cyclone Sidr in November 2007, over a period of three weeks in August 2008. The study subjects were mothers and their children aged 0 – 59 months. A total of 655 pairs participated from urban, urban-slum, and rural residential areas. Sampling was performed according to two methods: *i.e.*, recruitment via committee members' recommendation in urban-slum and rural areas, and a direct approach while the Expanded Program on Immunization (EPI) was provided in urban areas. The structured questionnaire, which adopted the parenting self-efficacy tools and the form of social support mechanism, was translated into Bengali, back-translated, and pre-tested. Data were collected via the questionnaire by trained interviewers. Child anthropometrics were measured based on the instructions of the World Health Organization.

Results:

Urban-slum showed the lowest socioeconomic status and the highest prevalence of underweight children (51.7%). In the case of child's acute health event (high fever), 95% of urban-slum mothers consulted with appropriate health facilities and 90% of the mothers participated in decision making. On the other hand, mothers' awareness of chronic malnutrition was inadequate. The majority of urban-slum mothers did not perceive the seriousness of underweight children, and 80% of the mothers did not recognize the lack of food/milk for the child. In the underweight group of urban-slum mothers, the perceived parenting confidence was relatively low (53.9%), and the perceived emotional depression was high (81.7%). Moreover, one reinforcing factor, support given family members and relatives, was significantly low among the underweight group ($P = 0.004$). Other social supports were also inadequate as evidenced by the absence of formal support (0%) and a lack of informal group support (0.9%). The degrees of parenting support from family members and relatives were significantly low in the underweight group ($P = 0.003$). Rearing mothers (3.6%), community leaders (2.7%), and healthcare providers (17.0%) were least recognized as

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parenting support resources.

Conclusions:

The results of this study can be summarized as follows. 1) Mothers and children in urban-slums were the most vulnerable because of the high prevalence of underweight among the children and low socioeconomic status. In urban-slums, although mother's health-seeking behavior in the case of acute health events in their children was appropriate, perception of chronic malnutrition (underweight) was inadequate. Social support was inadequate among the underweight group of urban-slum mothers. Family members/relatives were the most influential resources. Developing sustainable social networks among rearing mothers, including their family members and relatives, is essential in urban-slums.