

Effectiveness of a Nosocomial Infection Control Training in Improving Knowledge in Patient-Hired Attendants and Outsourced Workers in Taiwan

Chiou-Fen Lin • Chyn-Yng Yang* • Meei-Shiow Lu** • Ching-Chiu Kao***

ABSTRACT: Nosocomial infection represents an important indicator of healthcare quality and patient safety. Based on the experience gained during the outbreak of Severe Acute Respiratory Syndrome (SARS) in Taiwan in 2003, we gained greater awareness of the potential threat from patient-hired attendants and outsourced workers as bacteria carriers and transmitters. This study built a training model and evaluated training effectiveness in terms of improved knowledge. The training model included nosocomial infection control guidelines, a training CD, training program, evaluation form, and descriptive procedures for conducting training and evaluation. The training course for this study was conducted in 17 hospitals in Taiwan, with a total of 1,467 participants attending 27 seminars and 1,265 effective samples (return rate = 86.2%). Results of the study showed a statistical difference of $< .001$ before and after the training course on participant understanding of nosocomial infection control. Advantages of applying this training model include knowledge enhancement and reduced implementation time, manpower input and budget outlay. In addition to greater flexibility, the model can also positively influence clinical practice, improve patient safety and reduce hospital nosocomial infection rates. This program is worth promoting in hospitals and other healthcare institutions.

Key Words: attendants, outsourced workers, nosocomial infection control, knowledge improvement.

Introduction

The primary goal of nosocomial infection control is patient safety (Joint Commission on Accreditation of Healthcare Organization, n.d.; Pittet, 2005). All hospital personnel, including patient-hired attendants and outsourced workers, should participate in efforts to reduce the rate of nosocomial infections. They are often poorly managed and are lacking of the knowledge in nosocomial infection control. Mortality rates were higher in infected patients than in non-infected patients (Erbay et al., 2003). A well-planned training model for nosocomial infection control for this group of hospital workers is required (Yen, 2004).

The Unique Situation in Taiwan

Most hospitalized patients in Taiwan are taken care by private helpers hired by the patients' family. During the severe acute respiratory syndrome (SARS) episode in Taiwan in 2003, most hospital had patient-hired attendants and outsourced workers. Those temporary workers had no idea about nosocomial infection and became the true source to spread the disease (Chen et al., 2006). Unfortunately the SARS epidemic involved the staff outside of the hospitals during that difficult time. From this experience, we realized that all patients, their families, patient-hired attendants and outsourced workers should be properly trained on nosocomial infection control (Chang et al., 2005; Chen & Chang, 2004).

RN, PhD, Associate Professor, College of Nursing, Taipei Medical University; *RN, MSN, Director, Department of Nursing, Taipei Medical University Hospital & Adjunct Instructor, College of Nursing, Taipei Medical University; **RN, MSN, Endowed Professor, College of Nursing, Taipei Medical University; ***RN, MSN, Director, Department of Nursing, Taipei Medical University Wan Fang Hospital.

Received: April 17, 2008 **Revised:** June 19, 2008 **Accepted:** July 2, 2008

Address correspondence to: Ching-Chiu Kao, No. 111, Hsing-Long Rd. Sec. 3, Taipei 11696, Taiwan, ROC.

Tel: +886 (2) 2930-7930 ext. 8601; Fax: +886 (2) 8662-1145; E-mail: 675031@wanfang.gov.tw

Nosocomial Infection Control

Nosocomial infections are a primary factor causing inpatients to extend their length of stay in the hospital (Erbay et al., 2003; Sheng et al., 2005), wasting medical resources, exposing inpatients to risks of other infections and raising the risk of death (Goldrick, 2005). In Taiwan, the Centers for Disease Control (2007) reported an average nosocomial infection rate of 4.2‰–5.3‰ between 2004 and 2006. The nosocomial infection rate is an important health care quality indicator and a major consideration in hospital care quality evaluations (Chiu, Yang, Lin, & Chu, 2007; Wang, 2007). The importance of nosocomial infection control can never be ignored. Fortunately, more than one-third of nosocomial infections can be prevented (Berhe, Edmond, & Bearman, 2005).

Effective Control of Nosocomial Infections

Various strategies have been reported to control effectively nosocomial infection risk (Yang, 2007). Cleaning hands before and after physical contact with patients, for example, is one important measure (Anonymous, 2005; Lu, Chin, Tseng, Hsieh, & Shen, 2006; Rosenthal, Guzman, & Safdar, 2005). Many study results support the efficacy of on-the-job training (covering such topics as hand-washing and barrier protection) for hospital employees on nosocomial infection control strategies (Aragon, Sole, & Brown, 2005; Goldrick, 2005; Rosenthal et al., 2005), compliance with nosocomial infection control practices, and training to manage outbreaks.

The literature shows awareness of nosocomial infection control increasing in Taiwan, with increased implementation of prevention and control programs (Cheng, Chang, Yang, & O, 2005; Yang, 2007). However, no significant lowering of the nosocomial infection rate has been achieved. The nosocomial infection committee and its members cannot reduce nosocomial infection rates on their own, and effective control requires the effort of all hospital employees (Yang, 2007). Therefore, the first priority is to disseminate understanding of nosocomial infection control and ensuring that all hospital employees understand their role in achieving control objectives (Rosenthal et al., 2005; Stone, Hedblom, Murphy, & Miller, 2005; Yang, 2007).

The Australia National Health and Medical Research Committee published nosocomial infection guidelines for medical facilities in 1996, which set forth standard principles for nosocomial infection control and the framework needed in healthcare settings to develop infection control

protocols and systems. Nosocomial infection control in Australian hospitals has been effectively conducted and well-organized following introduction of the guidelines (Reed, Gorrie, & Spelman, 2003).

Training Nosocomial Infection Control

Posters, video tapes, oral presentations with slides, promotional flyers and operating manuals are all tools employed in training efforts (Berhe et al., 2005; Lin, Huang, & Yeh, 2001). One study in Taiwan examined the effectiveness of a training program with 10 classes of 50 minutes each. A 10-minute test with 15 yes/no questions were given to the trainees at the end of training (Yang et al., 2000). The results, which highlighted significant differences between hospital employees and patient-hired attendants and outsourced workers, indicate that the training course designed for hospital employees was not as well suited to this second group.

Efficiency evaluation examines benefits to trainees and to the overall organization (Caniza et al., 2007; Tsai, 2000). To control nosocomial infection effectively, the program evaluation should be set at the learning level (Bates, 2004). This study adapted the concept of learning level program evaluation and used written tests to measure knowledge acquisition.

Most previously reported training courses for nosocomial infection control have focused on control knowledge among physicians and nurses. (Fakih, Enayet, Minnick, & Saravolatz, 2006; Picheansatian et al., 2005; Voss, 2005). In Taiwan, while hospital nosocomial infection control training programs have included other internal medicine department personnel, patient-hired attendants and outsourced workers have not been invited to participate.

According to cognitive and behavior change theory, the following issues must be considered when designing training courses: (1) both course and class time should be held to a minimum; (2) multiple teaching methods should be employed; (3) courses should incorporate non-lecture content; (4) teaching points must be repeated; (5) material should be practical and associated with the experiences of students in their respective work environments; (6) "right" and "wrong" should be stated clearly and directly, and (7) teachers and students should maintain an interactive relationship. All these issues were considered in the training model design used in this study (Gordts, 2005).

Most patient-hired attendants and outsourced workers in hospitals are older, with relatively lower levels of

education. They are required to rotate duties frequently. Training models for those attendants must be specifically designed and tailored in terms of content, methods, and educational procedures. Teaching methods should be tailored to reflect the specific profile of the target group (Sheng et al., 2005; Vonberg, Sander, & Gastmeier, 2008).

The purpose of this study was to develop an effective nosocomial infection control model suited to patient-hired attendants and outsourced workers. We developed and made a training video CD based on nosocomial infection control guidelines. To evaluate the efficiency of this training program, we compared knowledge improvement between pre- and post-tests, including three phases and 10 tasks.

Methods

A quasi-experimental study was conducted between April 1st, 2004 and January 31st, 2005. Nosocomial infection control guidelines for patient-hired attendants and outsourced workers were drawn from relevant studies

(Chen, & Chang, 2004; Chen et al., 2006; Erbay et al., 2003; Lin et al., 2001; Reed et al., 2003; Tsai, 2000; Yang et al., 2000). Nosocomial infection control guidelines for professional health care workers referenced those used by six different hospitals in Taiwan. Initial guideline content for patient-hired attendants and outsourced workers encompassed 15 items. The guideline document was verified by five infection control physicians and five infection control nurses, who were asked to evaluate the level of importance for each item on a 0 (not important) to 10 (very important) scale. With one exception, all items having a mean score greater than 9 were retained in the final questionnaire. While experts reached a consensus on "washing hands before meals and after using the toilet," this item earned a value of only six. Experts also recommended the addition of two additional items.

Table 1 shows the final version of nosocomial infection control guidelines used in this study. A senior nurse was asked to edit the scenario for the training CD based on guideline contents. The scenario was then simplified by the research group. Content validity was established by eight

Table 1.
Nosocomial Infection Control Guidelines for Patient-Hired Attendants and Outsourced Workers

<p>Work area</p> <ol style="list-style-type: none"> 1. One must report to the nursing station or office in charge before entering a work area. 2. Workers, recently returning from a quarantine area/country or who have had unprotected physical contact with infectious disease patients, should relieve themselves temporarily from patient care duties. 3. One should immediately inform the head nurse or person in charge if feeling unwell. 4. One is not allowed to go into wards not specifically related to work duties. 5. Protective measures with regard to nosocomial infection control are enforced to the same standard as required of other employees in the hospital. <p>Environmental hygiene</p> <ol style="list-style-type: none"> 6. Always wear clean work clothes while in duty. 7. Always keep the ward clear and use different wipers in work areas and wards. 8. Don't shake the patient's bottom sheet after replacing it. <p>Personal protection-gloves and hand washing</p> <ol style="list-style-type: none"> 9. Always wear gloves when collecting samples from patients. 10. Always wear gloves when dealing with patient's excreta and waste. 11. Change gloves immediately if they break or when attending to a different patient. 12. Do not touch anything in common/public areas while wearing gloves. 13. Always wash your hands after taking off gloves; gloves are not a replacement for hand washing. 14. Wash hands both before and after providing services to a patient. 15. Wash hands with soap before meals and after using the toilet. 16. Wash hands with soap or sterilizing liquid if contaminated by dirt or blood. <p>Training on nosocomial infection control</p> <ol style="list-style-type: none"> 17. Nosocomial infection control training should be conducted in a timely and regular manner.
--

Table 2.
Schedule of Training Program

Time (mins)	Activities
20	Arrival/Sign-in
20	Pre-test (supervisor remarks)
20	Introduction to nosocomial infection control norms
20	Watch training video (VCD)
20	Discussion
20	Post-test (supervisor closing remarks)

nosocomial infection control experts. After completing filming, we did two major revisions. The final version was verified by four senior infection control nurses.

A training program (Table 2) was developed based on nosocomial infection control guidelines and the training CD to improve nosocomial infection control awareness among patient-hired attendants and outsourced workers. The integrated program, using traditional teaching methods and a multimedia video demonstration, was designed to improve the effectiveness of nosocomial infection control in hospitals.

An evaluation form was also developed to accompany the training program. The entire set of materials for the training course included an introduction to the research project and training process, a participation application form, a time schedule for nosocomial infection control training programs for patient-hired attendants and outsourced workers, infection control guidelines, a training CD, and evaluation form. This model was drawn from related studies (Lin et al., 2001; Reed et al., 2003; Tsai, 2000; Yang et al., 2000; Yen, 2004). The evaluation form was revised for brevity or to achieve a CVI (Content Validity Index) value < .86 from experts. Split-half reliability was .94. In total, 17 hospitals in Taiwan participated in this project.

Results

In total, 1,467 participants from 17 different hospitals in Taiwan participated in training conducted for this study. Participants included 382 workers from five hospitals in northern Taiwan, 280 workers from three hospitals in central Taiwan, 485 workers from six hospitals in southern Taiwan, and 320 workers from three hospitals in eastern Taiwan. Of the 1,380 evaluation forms received prior to training, 1,277 were considered valid and included in the study. Of the 1,377 evaluation forms received after train-

ing, 1,265 were considered valid (effective return rate: 86.2%).

Table 3 lists participant demographic information. Differences in understanding of nosocomial infection control practices before and after the training course were

Table 3.
Demographic of Participants (N = 1,265)

Item	n	%
Geographic Region of Hospitals		
Southern	440	34.8
Central	265	20.9
Northern	321	25.4
Eastern	239	18.9
Position		
Attendant	592	46.8
Outsourced worker	673	53.2
Hospital Type		
Medical center	280	22.1
Regional	955	75.5
Local	30	2.4
Age (years)		
Below 25	41	3.2
26–30	54	4.3
31–35	81	6.4
36–40	119	9.4
41–45	250	19.8
46–50	288	22.8
Over 51	414	32.7
not provided	18	1.4
Gender		
Male	147	11.6
Female	1006	79.5
not provided	112	8.9
Education		
None	37	2.9
Elementary	367	29.0
Junior high	327	25.8
High school	425	33.6
2 year college	57	4.5
University	29	2.3
not provided	23	1.8
Years in Current Job		
Below 1 year	229	18.1
1–3 yrs	376	29.7
4–6 yrs	279	22.1
7–9 yrs	168	13.3
10–12 yrs	103	8.1
13–15 yrs	35	2.8
Over 16 yrs	44	3.5
not provided	31	2.5



Table 4.
Test Scores Before and After Training (N = 1,265)

Item	Average pre-test score	Average post-test score	pair <i>t</i> value
1. Must report to nursing station or office in charge before entering to work area.	97	100	-5.47***
2. Workers, recently returning from a quarantine area/country or who have had unprotected physical contact with infectious disease patients, should relieve themselves temporarily from patient care duties.	97	99	-4.08***
3. Should go home immediately to rest if feeling unwell.	21	30	-5.40***
4. Protective measures with regard to nosocomial infection control are enforced to the same standard as required of other employees in the hospital.	99	100	-1.97*
5. Should not allow going into wards unrelated to assigned work.	94	99	-4.86***
6. Should always wear clean work clothes on duty.	99	99	-0.73
7. Always use different wipers for different wards.	60	73	-7.16***
8. Always wear gloves when collecting patient samples.	99	99	-0.38
9. Always wear gloves while dealing with patient's excreta and waste.	99	100	-0.99
10. Change gloves immediately once torn or when preparing to tend to another patient.	100	100	-0.38
11. Should not touch anything in public/common areas while wearing gloves, whether gloves are clean or not.	96	99	-4.42***
12. Wearing gloves will not only protect you, but also reduce the time needed to wash hands.	61	83	-12.58***
13. Should wash hands with soap before meals and after using the toilet.	99	100	-1.15
14. Wash hands with soap or sterilizing liquid if dirt or blood is found on hands.	100	100	0.45
15. Nosocomial infection control training should be conducted timely and regularly.	99	100	-2.50*
16. Should ask somebody else if work instructions are not completely understood.	53	70	-5.81***
17. Patient's bottom sheet should not be shaken after being replaced.	99	99	-1.22
18. Always wash hands before and after providing service to a patient.	100	100	1.42
Total	88.46	91.40	-10.252***

* $p < .05$. *** $p < .001$.

evaluated by a paired *t*-test, with results presented in Table 4. Statistical differences of $p < .001$ were obtained for both individuals and teams in patient-hired attendants and outsourced workers. Of 18 items in the evaluation form, 7 were found to have no significant change due to the pre-test ceiling effect. Individual participant attitudes showed statistical differences of $< .001$ on pre- and post-training results, regardless of occupation, age, gender, educational level, and years of experience.

Discussion and Conclusion

As shown in Table 3, most participants were middle-aged, had a relatively low level of education and little

working experience, female, and professed Buddhist or Taoist in beliefs. As many were unemployed or held a second job, we needed to offer a highly flexible training schedule and pay greater attention to individual needs to produce effective training outcomes.

In Taiwan, most large-scale medical centers and hospitals are located in the north, accounting for nearly half of the nation's medical resources. However, we found that hospitals most interested in participating in this study were in southern and eastern Taiwan. In other words, those with the least medical resources had the highest rate of participation. Few hospitals in northern Taiwan showed interest in participating in this study. The reason for this phenomenon may be that hospitals in the north Taiwan experienced

chaos during the SARS outbreak and thus had already implemented nosocomial infection control training programs for patient-hired attendants and outsourced workers. Middle- and small-sized hospitals in areas with fewer medical resources, on the other hand, were eager for outside support on the issue of nosocomial infection control training.

The result of this study shows that the nosocomial infection control training model improved knowledge significantly ($p < .001$) among patient-hired attendants and outsourced workers (Table 4). The model can be further improved to provide regular training courses for these frequently rotated hospital workers. Future studies should evaluate long-term effects of the improved program, including quasi-experimental studies using the nosocomial infection rate as an indicator of program success. Although 11 items of nosocomial infection control showed a significant improvement ($p < .001$) after training (Table 4), perfect scores (100%) have not yet been achieved. Study results suggest that there remain areas of potential improvement (Caniza et al., 2007; Picheansatian et al., 2005). This study found that participant attributes, including occupation, age, gender, level of education, religion, and years in current job had a significant impact on the amount of knowledge that an individual absorbed from training. To improve future training, attention should be paid during the design and planning stages to individual participant attributes (Vonberg et al., 2008).

The training model was highly successful in this study and is recommended for implementation in other hospitals. Training targets should include both patient-hired attendants and outsourced workers as well as new hospital/medical institution staff. The program can also be used to enhance existing training programs in hospitals. Every training tool used in this model was well-designed and showed good validity and reliability. Most items in the training model (e.g., guidelines, training CD, training program, and evaluation form) may be used independently for a variety of purposes. The training model and related tools developed in this study have been published on the Bureau of Health Promotion's public website: Department of Health, Executive Yuan (<http://health99.doh.gov.tw/>).

Implementing this model makes training more flexible. Hospital administrators can provide this training course to all new patient-hired attendants and outsourced workers with a brief introduction and written handout. Trainees can either take the nosocomial infection control training CD home or download the video directly over the Internet. Questions raised during the course of self-learning may be addressed

later in a short Q and A section. This training model helps save time, money and human resources, and ensures healthcare quality, patient safety, and increased patient family satisfaction with healthcare services, while reducing risks of nosocomial infections in hospitals. The training CD can also be used as a primer for a refreshment course targeting patient-hired attendants and outsourced workers as part of efforts to extend training material applications.

In Taiwan, the patient-hired attendants and outsourced workers in hospitals frequently change assignments. They often work at multiple hospitals, spending several days at one before going to another to care for another patient. As such, tracking behavioral changes in this population is difficult. A solution may be to conduct a quasi-experimental study over a longer period of time (such as 3 months) and use the rate of nosocomial infection as an outcome measure. Another potential study limitation was that many participants were not working at the largest of Taiwan's hospitals.

Acknowledgements

We would like to thank the Department of Health, Executive Yuan, Taiwan, for their funding support of this study; our ten professional experts, 17 hospitals and their staffs; all nursing colleagues at Taipei Medical University Hospital; all patient-hired attendants and outsourced workers who agreed to participate; and Professor Winston W. Shen, who provided helpful editing comments on a previous version of this manuscript.

References

- Anonymous (2005). Patient care guidelines for hand washing. *Journal of Infection Control*, 15(3), 194–197.
- Aragon, D., Sole, M. L., & Brown, S. (2005). Outcomes of an infection prevention project focusing on hand hygiene and isolation practices. *AACN Clinical Issues*, 16(2), 121–232.
- Bates, R. A. (2004). Critical analysis of evaluation practice: The Kirkpatrick model and the principle of beneficence. *Evaluation Program Planning*, 27(3), 341–347.
- Berhe, M., Edmond, M. B., & Bearman, G. M. L. (2005). Practices and an assessment of health care workers' perceptions of compliance with infection control knowledge of nosocomial infections. *American Journal of Infection Control*, 33(1), 55–57.
- Caniza, M. A., Maron, G., McCullers, J., Clara, W. A., Cedillos, R., Duenas, L., et al. (2007). Planning and im-

- plementation of an infection control training program for healthcare providers in Latin America. *Infection Control and Hospital Epidemiology*, 28(12), 1328–1333.
- Centers for Disease Control, R.O.C. (Taiwan). (2007). *Nosocomial infections surveillance system*. Retrieved April 3, 2008, from <http://www.cdc.gov.tw/public/Attachment/7121715365671.pdf>
- Chang, D. M., Lin, S. H., Peng, M. Y., Hsiao, J. L., Huang, S. Y., & Huang, C. C. (2005). The impact of SARS control on nosocomial infection. *Journal of Health Education*, 23, 161–176.
- Chen, Y. C., & Chang, S. C. (2004). Infection control of SARS. *Formosan Journal of Medicine*, 8(1), 84–90.
- Chen, Y. M., Liang, S. Y., Shih, Y. P., Chen, C. Y., Lee, Y. M., Chang, L., et al. (2006) Epidemiological and genetic correlates of severe acute respiratory syndrome coronavirus infection in the hospital with the highest nosocomial infection rate in Taiwan in 2003. *Journal of Clinical Microbiology*, 44(2), 359–365.
- Cheng, Y. A., Chang, C. W., Yang, S. C., O, I. L. (2005). The Investigation of Recognition for Hospital-acquired Infection – the Example of Medical College Students in the Southern of Taiwan. *Chinese Journal of School Health*, 46, 97–104.
- Chiu, W. T., Yang, C. M., Lin, H. W., & Chu, T. B. (2007). Development and implementation of a nationwide health care quality indicator system in Taiwan. *International Journal for Quality in Health Care*, 19(1), 21–28.
- Erbay, H., Yalcin, A. N., Serin, S., Turgut, H., Tomatir, E., Cetin, B., et al. (2003). Nosocomial infections in intensive care unit in a Turkish university hospital: A 2-year survey. *Intensive Care Medicine*, 29(9), 1482–1488.
- Fakih, M. G., Enayet, I., Minnick, S., & Saravolatz, L. D. (2006). A web-based course on infection control for physicians in training: An educational intervention. *Infection Control and Hospital Epidemiology*, 27(7), 704–708.
- Goldrick, B. A. (2005). The practice of infection control and applied epidemiology: A historical perspective. *American Journal of Infection Control*, 33(9), 493–500.
- Gordts, B. (2005). Models for the organization of hospital infection control and prevention programmes. *Clinical Microbiology Infection*, 11(1), 19–23.
- Joint Commission on Accreditation of Healthcare Organization. (n.d.). *Infection control*. Retrieved April 3, 2008, from <http://www.jointcommission.org/PatientSafety/InfectionControl/>
- Lin, K. S., Huang, C. C., & Yeh, Y. R. (2001). Responsibility and scope of infection control. *Formosan Journal of Medicine*, 5(4), 449–456.
- Lu, C. C., Chin, T. F., Tseng, C. Y., Hsieh, S. M., & Shen, C. Y. (2006). The importance of hand washing in the prevention of nosocomial infection control in ICUs. *Taiwan Medical Journal*, 49(6), 30–34.
- Picheansatian, W., Moongtui, W., Soparatana, P., Chittreecheur, J., Apisarnthanarak, A., & Danchaivijitr, S. (2005). Evaluation of a training course in infection control for nurses. *Journal of the Medical Association of Thailand*, 88(10), S171–176.
- Pittet, D. (2005). Infection control and quality health care in the new millennium. *American Journal of Infection Control*, 30(5), 258–267.
- Reed, C. S., Gorrie, D., & Spelman, D. (2003). Hospital infection control in Australia. *Journal of Hospital Infection*, 54(4), 267–271.
- Rosenthal, V. D., Guzman, S., & Safdar, N. (2005). Reduction in nosocomial infection with improved hand hygiene in intensive care units of a tertiary care hospital in Argentina. *American Journal of Infection Control*, 33(7), 392–397.
- Sheng, W. H., Chie, W. C., Chen, Y. C., Hung, C. C., Wang, J. T., & Chang, S. C. (2005). Impact of nosocomial infections on medical costs, hospital stay, and outcome in hospitalized patients. *Journal of the Formosan Medical Association*, 104(5), 318–326.
- Stone, P. M., Hedblom, E. C., Murphy, D. M., & Miller, S. B. (2005). The economic impact of infection control: Making the business case for increased infection control resources. *American Journal of Infection Control*, 33(9), 542–547.
- Tsai, W. C. (2000). Training and recruiting for employees. In C. Lee (Ed.), *Human resources 12 lectures* (pp. 55–76). Taipei: Tian Xia.
- Vonberg, R. P., Sander, C., & Gastmeier, P. (2008). Consumer attitudes about health care acquired infections: A German survey on factors considered important in the choice of a hospital. *American Journal of Medical Quality*, 23(1), 56–59.
- Voss, A. (2005). The training curriculum in hospital infection control. *Clinical Microbiological Infection*, 11(1), 33–35.
- Wang, S. H. (2007). Patient's safety and healthcare quality: Perspectives from in-hospital infection control. *Taiwan Society of Critical Care Medicine*, 8(4), 166–174.
- Yang, M. H., Chen, Y. W., Chang, C. M., Yim, S. Y., Lo, M. H., & Chang, F. Y. (2000). Continuing medical education of nosocomial infection control for health care workers in a teaching hospital. *Nosocomial Infection Control Journal*, 10(4), 245–253.
- Yang, Z. Y. (2007). New trends in infection control. *Leadership Nursing*, 8(1), 1–9.
- Yen, M. Y. (2004). Evolution of nosocomial infection and hospital evaluations following SARS. *Journal of Infection Control*, 14(3), 175–180.

看護工和外包人員院內感染管制訓練知識 提昇成效之探討

林秋芬 楊勤熒* 盧美秀** 高靖秋***

摘要：院內感染是照護品質和病人安全的重要指標，從 SARS 的經驗，讓我們關注到醫院中一群重要的病菌傳播者，那就是病人私自聘請的看護工和醫院的外包人員。因此本研究在建構醫院看護工和外包人員院內感染管制教育訓練模式和評值教育訓練知識提昇成效，內容包括：院內感染管制指引、訓練光碟、訓練課程、評值表和訓練與評值流程。本訓練課程於台灣 17 家醫院進行，共舉辦 27 場次，參加人數共計 1,467 位，有效前後測樣本數為 1,265 份，有效回收率為 86.2%。結果發現，教育訓練前後，看護工和外包人員對院內感染管制的知識呈現統計學上 $< .001$ 的顯著差異。此套教育訓練模式的應用，可以增加知識，達到省時、省力、省錢和具彈性等的目的，以及影響臨床實務，提升病人安全，降低醫院的院內感染率，值得廣泛的推廣。

關鍵詞：看護工、外包人員、院內感染管制、知識提昇。

臺北醫學大學護理學系副教授 *臺北醫學大學附設醫院護理部主任兼臺北醫學大學護理學系講師
臺北醫學大學講座教授 *臺北醫學大學萬芳醫院護理部主任
受文日期：97年4月17日 修改日期：97年6月19日 接受刊載：97年7月2日
通訊作者地址：高靖秋 11696 臺北市興隆路三段 111 號

