

## Effectiveness of Training on Performance of Public and Private Gynecologic Service Providers in Infection Control in Iran

<sup>1</sup>Jabbari Hosein, <sup>2</sup>Bakhshian Fariba and <sup>3</sup>Asghar Mohammadpoorasl

<sup>1</sup>Department of Health Administration, Faculty of Medicine, <sup>2</sup>Department of Midwifery,

<sup>3</sup>Department of Epidemiology, School of Health and Nutrition,

National Public Health Management Center (NPMC),

Tabriz University of Medical Sciences, Tabriz, Iran

**Abstract:** Due to recent changes in service provision, from hospitalization to out patient therapy, it is necessary to control infection in out patient units. But recent studies in Iran indicates that common processes of sterilization is being done by health aids with no pervious training; also series of appropriate actions about making and using disinfectant solutions, washing and sterilization of used materials is being ignored by physicians and midwives. The aim of present study, was to determine the effectiveness of training on performance of gynecologist service provider in relation to infection control in Tabriz (Northwest of Iran). In this interventional study, 137 public and private hospitals and clinics and out patient gynecologic units, selected randomly. Special training classes were prepared for all units' staff through different sessions. Then two series of data collection were fulfilled. Data from private unites were randomly gathered in both stages. We used a questionnaire and a checklist with 42 questions about personal and professional information of staff. Only 3% of the study populations had offered training in infection control but after intervention all of them participated in education programs. Performance of 73% of study populations before intervention and 27% of them after intervention was not acceptable. Our results show failures in decontamination, cleaning, sterilization, disinfection improved performance of gynecologists and midwives in most of items. Problems in hand washing and few items remained unchanged after intervention. Results of this intervention are similar to a number of studies that have been published in recent years in Iran. The main recommendation in all studies was promotion of knowledge and skills of health workers. This study recommendation is exactly policy making in infection prevention in medical universities of Iran and monitoring and assessing of acts in health care setting.

**Key words:** Training, performance, gynecology service providers, infection control

### INTRODUCTION

Health care-associated infections occur worldwide and affect both developed and resource-poor countries. Infections acquired in health-care settings are among the major causes of death and increased morbidity in hospitalized patients. They represent a significant burden for both the patient and his or her family and for public health.

A prevalence survey conducted under the auspices of WHO in 55 hospitals of 14 countries representing four WHO regions revealed that, on average, 8.7% of hospital patients suffer nosocomial infections. At any time, over 1.4 million people worldwide suffer from infectious complications associated with health care (WHO, 2002).

Due to recent changes in service provision, from hospitalization to out patient therapy it is necessary to control infection in out patients units.

Genital and urinal tract infection involve important part of infections (Bromand *et al.*, 2007). Recent studies in Iran indicates that common processes of sterilization is being done by health aids with no pervious training; also series of appropriate actions about making and using disinfectant solutions, washing and sterilization of used materials is being ignored by physicians and midwives (Jabbari *et al.*, 1997) on the other hand there is no codified articles from health deputy of universities in these cases. A recent survey on infection controlling and prevention in Varamin city indicated that only 25% of dentists were using the Dry heat properly (meeting time and temperature

limit) (Gerami, 2003). Microbial testing of the metal utensils used in mouth surgery units in different units of Tehran faculty of dentistry showed a 20 times decrease of infection rate comparing to the survey done in 1995 (Ramazania, 2002). Studying the provision of physicians and nurses about function of autoclave in England in 2000, showed that only 19% of them were habitually checking the function of the system and 0/6 of the autoclaves had fault in sterilization (Coulter *et al.*, 2000).

In Tabriz city 25% of the central sterile supply departments had acceptable performance 3; besides the most important weakness in infection prevention among women applicant for IUD in Tabriz health centers was about controlling the dry heat and lack of proper hand washing and drying them before IUD insertion (Bakhshian and Khoshbaten, 2002).

Existence of different nonchalantly evidence about infection control and its rising trend in developing world (Anonymous, 2002) and high majority of married women (18% of population) (WHO, 1997) and their request for health services (gynecologic and other examinations, IUD insertion and other health services) in public and private health centers and importance of infection prevention in these units, made us monitor the function of midwifery and gynecological service providing units in infection control in our country Iran for the first time through a training intervention.

## MATERIALS AND METHODS

In this interventional study, 137 units out of 400 public and private hospitals and clinics and out patient gynecologic units, selected randomly. Special training classes were prepared for all units' staff through different sessions. Then two series of data collection were fulfilled. Data from private units were randomly gathered in both stages. We used a questionnaire and a checklist with 42 questions about personal and professional information of staff, general process of infection prevention (cleaning, sterilization, disinfection and controlling) and process of vaginal examination in which microbial cultures of used metal utensils was made and were analyzed in microbiological department of Tabriz University of Medical Sciences. Questionnaire and checklist were made by the researchers using proper scientific texts whose scientific validity was tested by content validity method with 5 of clear sighted colleagues. Results showed a correlation of 96% after Pierson correlation-test which certified the capability of the tool for study.

In order to monitoring the performance of the units, qualitative criteria changed in to quantitative ones, in this way zero was assumed for negative answers while 1 presented for agreed cases in the checklist, besides some

of important questions like using disposable speculums, accurate temperature, required duration of dry heat or autoclave functioning were given scores form 5-15; for total performance maximum score was 100.

## RESULTS AND DISCUSSION

Public units consisted 43/5% of the studied comparing to 56/5% of private health units. Hospitals, clinics, health centers and private registries involved 3/4, 13/7, 44/8 and 38/1% of the cases, respectively.

22/5% of service providers were gynecologists and the rest were midwives. Average daily attendance was about  $9/97 \pm 9/04$  (18/85 for gynecologists and 7/7 for midwives). Fifty six percent of gynecologists and 40% of midwives had work experience of more than 10 years.

There was a positive correlating among positive microbial culture and number of attendance ( $r = 0/35$ ); there was also a positive relation among the results of microbial studies, meeting total infection control principals, sterile examination and antecedent of service providers ( $r = 0/75$ ).

Sixteen percent of gynecologists and midwives and 3/8% of their aids had no taken part in infection controlling training classes which improved after the program (100%).

Table 1 illustrates the function of studied units in provision of infection control principles before and after the intervention.

Proper function of autoclave and dry heat needs regular specific controlling which hasn't been highly considered before and after the intervention.

Microbial culture of used metal instruments is one of the most simple and important tasks which should be done in a certain interval, has not been noted (6/9% before and 9/5% after the study). There a slight increase of 5% in using proper metal instruments while we had quite a considerable betterment in rubbish collection methods and healthy dump trash.

In spite of the importance of hand washing before and after every examination, 16/5% of the units lacked these facilities in their working room.

Statistics analyzes showed the meaningfulness of mentioned information ( $p < 0/001$ ).

Using disinfectants was not so satisfactory both before and after the intervention due to the executive problems and illiterate or semi illiterate health aids while we had a noticeable reform in temperature and time limit; to insure the sterilization procedures it is need to use spore biologic tests and to have periodic accurate sampling which has been ignored in the most of health units in our country. On the whole, sterilization and disinfecting changed form less important procedure to most important processes after the intervention (Table 2).

Frequency of hand washing has fallen in spite of training intervention which can be related to common use of disposable speculums and sterilized latex gloves where as we note a favorable increase in washing hands after contacting with mucous membrane, blood and other secretions and changing bed cover after examination (Table 3).

Results of controlling microbial infection of metal equipments during vaginal and uterine examinations

which keeps its importance against lack of using physical and biological markers in sterilization procedures has been presented present in Table 4.

As we can see in Table 4, there is a slight increased rate of positive results in sterilized metal speculums after intervention while other cases has changed efficiently both quantitative and qualitative; 44% of the samples carried gram negative basils and large amount of colonies while there was no gram negative culture after

Table 1: Function of studied units in provision of infection control principles before and after the intervention

Row	Noted items	Performance ( partial frequency)			
		Before training		After training	
		Yes	No	Yes	No
1	Regular controlling of Dry heat or autoclave by medical engineers	0/8	99/2	12/8	87/2
2	Periodic sampling of instruments and gynecologic bed.	6/9	93/1	9/5	90/5
3	Using disposable speculum	21/5	78/5	76/4	23/6
4	Using proper metal instruments ( without rust)	80	20	84/5	15/5
5	Proper trash collection	90	10	95/9	4/1
6	Healthy dump trash	50/8	49/2	95/3	4/7
7	Hand washing facilities in examination room	83/8	16/2	86/5	13/5

p value, p<0/001

Table 2: Studied units performance in disinfecting and sterilization procedures

Row	Noted items	Performance ( partial frequency)			
		Before training		After training	
		Yes	No	Yes	No
1	Using disinfectant solution for metal instruments	83/1	16/9	68/9	31/1
2	Proper density of disinfectant solution	53/1	46/9	67/6	32/4
3	Using proper disinfectant solution	72/3	27/3	80/4	19/6
4	Meeting standard time limit for disinfecting	50/8	49/2	66/2	33/8
5	Using physical markers in sterilization procedures	30	70	74/3	25/7
6	Meeting standard time limit of sterilization	47/7	52/3	88/5	11/5
7	Meeting expected temperature during sterilization	47/7	52/3	88/5	12/2

pvalue, p<0/001

Table 3: Function of studied units in meting infection control principles during examination

Row	Noted items	Performance ( partial frequency)			
		Before training		After training	
		Yes	No	Yes	No
1	Washing hands before examination	17/7	82/3	13/5	86/5
2	Using latex gloves (both hands) during examination	83/1	16/9	90/5	9/5
3	Properly wearing the latex gloves	85/4	14/6	99/3	7
4	Washing hands after contacting with mucous membrane, blood and other secretions	65/4	34/6	95/3	4/7
5	Changing bed cover after examination	83/1	16/9	97/3	2/7
6	Covering sterilized instruments during procedure	55/4	44/6	93/2	6/8

p value, p<0/001

Table 4: Results of microbial sampling

Row	noted items	Performance ( partial frequency)	
		Before training	After training
		Yes	Yes
1	Metal speculums (ready to be used)	12/3	14/2
2	Speculums inside metal boxes or inside the dry heat	20/8	10/8
3	Tenacolumes and forceps	12/3	9/5
4	Lubricant solution used for examination	0	0

p value, p<0/001

intervention which may be linked to the use of metal speculums. Lubricant solution samples reported negative in all of the made samples.

Function of 73% of the units was not so pleasant which improved after the study and fell to 27%; intervention results in some cases like using disposable speculums have shown an incredible rise even in some units use of these speculums reaches to 100% (public health centers) while there was no betterment in the case of some other important cases like hand washing.

Our results (carelessness in infection control) coincides several studies in country (Bromand *et al.*, 2007; Jabbari, 1997; Gerami, 2003; Ramzani, 2002; Bakshian and Khoshbaten, 2000) and other countries (WHO, 1997; Rohm and Jakimiak, 2004; Sangthong *et al.*, 2005; CDC, 2000; Enrique *et al.*, 2002).

Different studies in Kerman shah, Rasht (cities in Iran) are sample of indifference in infection control. On the other hand, results of this study supports the findings of main researchers in Tabriz in 1996-97 (Jabbari, 1997).

### CONCLUSION

The last word is that this study, changed sterilization and disinfecting process from a less important matter into a noticeable process especially in the case of using autoclave and other systems. Study results strictly emphasizes the planning and holding retraining courses; inadequacy of merely training programs is also questionable; the following suggestions seems to have a good affect on our way in controlling and preventing infection.

### SUGGESTIONS

- Organizing and magnifying infection control teams and committees at health and therapeutic deputy levels of universities of medial sciences and planning and performing infection control assessments in different out patient centers especially in dentistry and gynecologist units.
- Periodic evaluation of infection control in outpatient therapy centers by control team using questionnaire and microbial sampling.
- Compulsory using of biologic test spores in all the units in order to controlling serialization process.
- It is desired to have qualified nurses, midwives and other health staffs as aids in specialized centers instead of illiterate and unqualified individuals.
- Distribution of prepared training text in all of gynecologic units especially in private sectors in national level.

- Holding periodic training workshops for gynecologists, midwives and their aids every two years.
- Relating evaluative results in professional improvement assessment factors of health staff especially in public units as a stimulus for better performance.

### REFERENCES

- World Health Organization, 2002. Prevention of hospital acquired infections, (2nd Edn.), WHO/CDC/CSR/EPH: 1-3.
- Bromand, M., N. Paydary and F. Behjat, 2007. Survey the rate of urine hospital acquired infections and determinants of them in Tehran heart center. International congress of infection control. www.icoic.com.
- Jabbari, H., 1997. Survey on Performance of Central Sterilization Rooms in Tabriz Hospitals. MS dissertation in Health administration. Iran Medical University: 1.
- GeramiPanah, F., 2003. Monitoring infection control in private dentistry clinics in Varain city. Dentistry J. Tehran Univ. Med. Sci., 4: 61-79.
- Ramzani, M., 2002. Monitoring microbial infection of metal instruments before using in mouth surgery. Dentistry J. Tehran Uni. Med. Sci., 15: 47-63.
- Coulter, W.A., C.A. Chew-Graham, S.W. Cheung and F.J.T. Burke, 2000. Autoclave performance and operator autoclave use knowledge of auin primary care: A survey of UK practices. J. Hospital Infect., 11: 406-410.
- Bakshian, F., M. Khoshbaten, 2000. Monitoring infection control disciplines in health units in Tabriz. Tabriz University of Medical Sciences, Presented in Shiraz Infection Control Congress, pp: 38.
- Anonymous, 2002. Tabriz medical university. Annual health statistics.
- WHO, 1997. Intrauterine devices Technical and managerial guidelines for services. Geneva, pp: 77-80.
- Rohm-Rodowald E. and B. Jakimiak, 2004. Assesment of the sterilization of medical devices-an important to health care in Poland. Przegł Epidemiol., 58: 501-510.
- Sangthong, K., P. Soparat, W. Moongtui and S. Danchaiyijitr Development of quality indicators of the central sterile supply department. J. Med. Assoc. Thai., 88: 128-132.
- CDC (Center for Diseases Control and Prevention), 2000. Monitoring Hospital-Acquired Infection to Promote safety U.S.A 1990-1999 MMWR., pp: 151-153.
- Enrique, A., M. Victor hugo, H. Aurelio, P. Leonor Sanchez, 2002. Biologic monitoring of dental office sterilizers in Mexico. AJIC., 30: 153-157.