

Implementation of a Need Based Participatory Training Program on Hospital Infection Control: A Clinical Practice Improvement Project

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1. Introduction

Infection control education has been a core component of infection control programs since they were established (Scheckler *et al.*, 1998; Department of Health and Ageing, 2004) and remains a constant feature in the modern healthcare context. Education is a pivotal strategy used to address problems identified through surveillance of infection or to improve infection control practice. (Dubbert *et al.*, 1990; Scheckler *et al.*, 1998; Turner *et al.*, 1999). It is clear that simple educational efforts are of minimal benefit and that while a number of interventions may achieve a short-term effect, few have a measurable, prolonged effect (Larson, 1997). Research efforts relating to infection control education as a control measure; have focused on evaluating the effectiveness of a variety of strategies (Kim *et al.*, 2001).

While debate continues regarding the extent and quality of infection control education as a component of professional curricula, it is a requisite element of the orientation process in each healthcare facility. This process ensures that all members of the healthcare team are provided with basic infection control education and training on entry to the healthcare organization. Basic infection control information such as standard and additional precautions, safe use and disposal of sharps, waste segregation and minimization and staff health issues such as vaccination should be imparted through continuing education. Research efforts relating to infection control education as a control measure; have focused on evaluating the effectiveness of a variety of strategies (Kim *et al.*, 2001). Studies often describe the effects of educational initiatives in combination with dissemination of data derived from surveillance initiatives such as practice audits (Goetz *et al.*, 1999 and Chandra and Milind, 2001).

Establishing appropriate Infection control staffing levels for hospitals should be considered as a priority in every health care setting (Hoffman, 1997). Multiple logistic regression analysis found that larger hospitals (OR, 1.6; 95% CI, 1.2-2.0; $P = .003$) and teaching hospitals (OR, 3.7 95% CI, 1.2- 11.8; $P = .02$) were associated with the presence of VRE. Hospitals were less likely to have VRE when infection control staff frequently contacted physicians and nurses for reports of new infections (OR, 0.5; 95% CI, 0.3- 0.7; $P = .02$) and there were in-service programs for updating nursing and ancillary staff on current infection control practices. Prevention of hospital associated infection remains biggest challenge for health

care providers in the developed countries where there are adequate resources and trained staff. We can envisage the hard-fought task of countries like India with minimum resources and non-availability of trained infection control personnel. It is almost impossible to have 1.5 infection control practicing nurses for every 200 beds. Most of the Indian hospitals are not even near to the recommended staffing criteria.

All health care professionals are responsible for ensuring that they consistently deliver high quality clinically effective care and protect their patient from the risk of infection. To do this they need clinical credibility, leadership skills, ability to participate and lead relevant practices and whole range of skills associated with implementation of infection control programs. This ability may be enhanced through continuing education. It was observed that infection control practice and ongoing primary surveillance at unit level is the most challenging task and almost impossible with present staffing model.

The Purpose of the study is to empower selected core group nurses with participatory training on hospital infection control with a view to train other nurses in hospital. Thus providing facilities for ongoing training program for sustained improvement in infection control practice.

This study addresses the following questions regarding improving infection control nursing education and practices in the Indian setting;

1. Why educational programs on hospital infection control are a Herculean task to implement?
2. How to develop an effective and sustainable hospital infection control educational program to empower the nurses working in a selected hospital?
3. Will nurses on ward develop ownership and awareness of infection control activities?
4. How does the culture of the clinical environment influence infection control practice?

Present study is conducted in several hospitals like private multi-specialty ,rural suburban and government settings of Udupi and Dhakshina Kannada district of Karnataka, India.

2. Methodology

The main strategy of the participatory training was needs-driven, internally and determined exercises to facilitate this, the approaches included were;

1. Developing human resources by empowering them with the knowledge required to perform infection control practices and transfer this knowledge to other nurses working with them without any extra effort and cost so that individual participants, the organization and the research project would benefit.
2. Inspiring participants, so that they are motivated to use creativity in developing participatory approaches and techniques.

According to Rao et al.,(1997), participation is closely linked to power and Knowledge. Sources of power and the distinction between dominant knowledge and popular knowledge are important to understand to contextualize participation. *Power in the society is exercised through knowledge. The culture of silence associated with powerlessness is essentially related to lack of articulation and domination of dominant knowledge over people's knowledge.* This is possible by building each individual participant's communication, leadership, small group teaching and

facilitating skills and finally developing professional approach towards prevention of Hospital associated infections.

The paradigm shift associated with participation, essentially means, providing space and articulation for popular knowledge, practices and analysis. This helps the powerless to exercise their control over knowledge generation, distribution and will be able to control knowledge and power, there by demystifying dominant knowledge. According to Kiessling, (2003) participation is also seen as an integral part of empowerment process. Thus participation is part of empowerment strategy. Continuous professional development also includes learning from others. The word participation stands for the action or state of taking part with others in an activity'. The fundamental basis of all participatory learning methods is that learners are active participants instead of passive listeners or readers.

The present study of participatory education will empower the nurses by building their capacity and to transmit their current knowledge and skill to prevent infection in low resource settings. During participation the nurses will be exposed to in interactive education, participatory seminars, workshops and other nursing education activities. In their true sense, participatory approaches are important tools to promote practice change, develop the capacity for collective action and reflection, and ensure that people involved are in the decision making process especially in Low resource setting and to enhance power to alter professional practice (Sudhaker, 2005; Kiessling, 2003; Upendranadh,1997; Brigham and Foster; Hodson, 1991) When adults participate in learning activities, they bring many years of experiences with them. They view new material through the lens of these experiences (Baird, Schneier and Laird, 1983). As adults continue to acquire newer knowledge and skills, they must integrate new learning with prior learning. When contradictions or dilemmas result, perceptions based on prior learning must be re-examined. Individuals can choose to reject the contradictory new information or revise their previous views. Transformative learning occurs when adjustments to prior learning are made (Cranton, 1996; Pilling-Cormick, 1997). There are two goals in the experiential learning process. One is to learn the specifics of a particular subject matter. The other is to learn about one's own strengths and weaknesses as a learner. This understanding of learning strengths and weaknesses helps in the back-home application of what has been learned and provides a framework for continuing learning on the job. Day-to-day experience becomes a focus for testing and exploring new ideas. Learning is no longer special activity reserved for the classroom, but becomes an integral and explicit part of work itself. (Justice and Jamieson, 1999) To incorporate this researcher developed learners handbook based on the need assessment and extensive literature review and validated this with experts

The present study was conducted in different phases;

Phase I-Survey for need assessment was conducted using survey questionnaire (28 items) for 700 nurses from rural suburban, referral and government hospitals.

One of the most important influences in the development of Participatory research has been the work of Paulo Freire. Freire linked the process of knowing with that of learning, through an ongoing cycle of reflection and action (praxis). This learning process stimulates the growth of critical thinking, which raises critical awareness in learners of the world about them. Alongside Freire's ideas came a parallel development, that of the phenomenologist who held experience as a legitimate source of knowledge. Thus, experience was added to reflection and action, as factors that could influence practice.

In phase II-40 nurses from different settings were elected as observers; they were given to observe infection control practices. Randomly selected participants were called for discussion and they were given a pretest using Demographic Proforma and Knowledge Questionnaire (alpha 0.81) and observed for their infection control practices at their unit by the observers using observation checklist ($r=0.9$). Upon completing the pretest, the learners' handbook on Hospital infection control for nurses along with the video (CD) was given to them to study before attending the training program. Core group nurses participated in 2 days participatory infection control training using different participatory teaching and learning activities, organized by the participants themselves. Posttest was given to this core group of nurses 1 month and 3 months after the training. During Phase III-Each of the Core group nurses trained 10 trainee group nurses from their respective units (400 trainee nurses). Pretest and posttest were given to this group at 1-week intervals. Phase IV-The FGD sessions were conducted at 3, 6 and 9 months at 3-month intervals to assess the impact of training to improve their infection control practice. Phase V-The core group nurses also encouraged to involve infection control related practice improvement in their area with the help of their network; they are encouraged to share their successes and failures and get peer support during their FGD sessions. Opinion survey on administrators /supervisors (40) collected to evaluate the impact of the program in clinical area. Total sample size was 1284.

The first step of the intervention was involving core group nurses to identify the gap between current and expected infection control practice and encourage them to raise awareness from what was called "*Unconsciously incompetent to consciously competent*" among all core group members to decrease the gap using their own techniques, accessible and available to them in their own areas. The core group nurses were encouraged to involve with infection control related practice improvement along with training of other nurses. These core group nurses formed a network and shared their problems and progress and tried to find solutions to overcome some challenges along with researchers and some nursing administrative staff. They shared small success stories and ideas to solve infection control related problems in their work place and also the frustrations and anger towards their inability to correct most of the infection control practice related challenges.

This forum also gave them a sense of belongingness, and enhanced their capacity to communicate. The network of core group nurses helped them to share their knowledge and education materials and also helped their participation in infection control activities like surveillance and reporting at unit level. The gaps were found out using focus group discussion and analysis. The FGD was repeated every 3 months to follow up the impact of participatory infection control education and their actions to improve infection control related clinical practice.

3. Results

- Learning need assessment analysis of the nurses on infection control training

Majority selected teaching methods like group discussion (83.38) demonstration (79.31), video (79.31) self study (77.03) and only 16.61% selected lecture as their preferred mode of teaching and learning. There was 100% agreement with the topics like Infection transmission in the health care setting, Misconception about disease transmission, Importance of following infection control, Methods of infection control, Standard

precautions Hand washing and use of gloves, Disinfections, Aseptic technique management of sharps sterilization and waste management.

Knowledge and practice of staff nurses on hospital infection control

i. Core group nurses

The mean post-test -1 (45.55) and post test-2 (49.20) knowledge score are higher than the mean pre-test scores (23.40) of core group nurses who underwent participatory training program on infection control. The mean post-test -1 (24.75) and post test-2 (25.32) practice score are higher than the mean pre-test scores (16.87) of core group nurses who underwent participatory training program on infection control.

ii. Trainee group

The mean post-test (41.01) knowledge score are higher than the mean pretest scores (23.96). The mean post-test (25.05) practice score are higher than the mean pre-test scores (19.66) of trainee group nurses who underwent participatory training program on infection control by core group nurses.

Effectiveness of participatory training program

- Core group nurses

A repeated measures one-way ANOVA revealed that there were significant differences in the knowledge of core group nurses participated in the participatory infection control $F(1,39) = 483.89$ $p < .001$, was a relatively significant effect size (Eta-squared = 0.92). Post Hoc LSD comparisons revealed that all three means were significantly different from each other. The practice of core group nurses were significantly different between the three times of measurement, $F(1,39) = 151.628$, $p < .001$, was a relatively significant effect size (Eta-squared = 0,60). Post Hoc LSD comparisons revealed that all three means were significantly different from each other.

- Trainee group of nurses

There was a significant increase in knowledge ($t(353) = 17.05$) and the practice ($t(353) = 20.20$) of trainee group who have undergone the participatory infection control training program by core group nurses. Their knowledge is independent of their age(0.85), education 2.85, exposure to previous teaching (0.61) and their years of experience 3.35. Their practice is also independent of the age(1.82), education(3.38), exposure to previous teaching (0.35) and their years of experience(0.52).

Clinical practice improvement

Quantitative enquiry has limitations to go in-depth for questions like; how significantly this program helps to improve infection control practice in the health care delivery system. To understand the impact of participatory infection control education, researcher aimed to reflect the opinions and experiences of the core group nurses using qualitative enquiry, which relies on inductive reasoning to interpret and structure the meanings that can be derived from the focus group discussion data. According to Bero, et al., (1998) it is evident that no single solutions will address all barriers at many levels of health care delivery system.

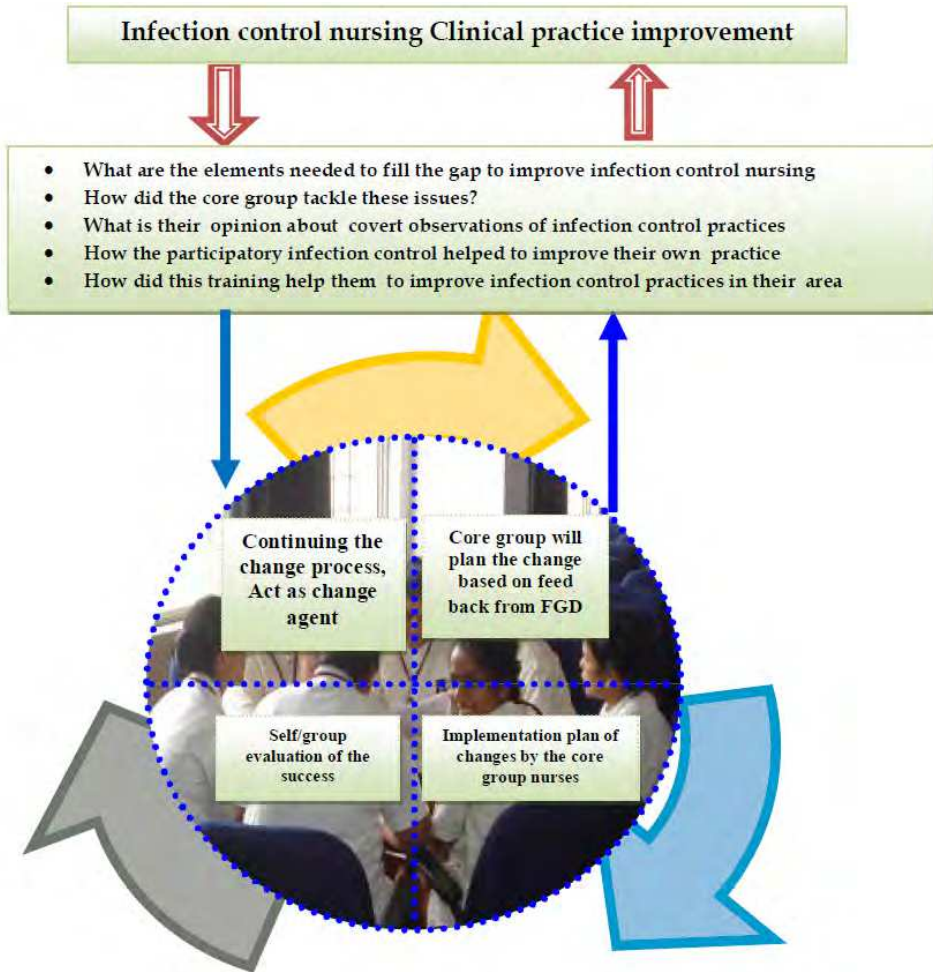


Fig. 1. Infection control nursing practice improvement model. Part of the theoretical framework was based on a strategy to change practice by Langley et al.,(1996) Institute for Healthcare Improvement, Boston

Based on the findings of Bordley, et al.,(2001) it was considered that clinical practice improvement method was bound to be effective in changing clinical practice to overcome the barriers that keep health care professionals from changing their practice and to reduce external pressures to change, such as increased workload and lack of time. The researcher utilized this model to guide the infection control practice improvement of the nurses working in the selected areas. Fundamental components for clinical practice management:

1. *Developing the knowledge and skills for understanding human performance, for minimizing and dealing with error.*
2. *The application of methods to identify measure and analyze problems with care delivery.*

3. *Action upon that information to improve both the individual and the systemic aspects of care delivery (infection control nursing).*

The researcher also analyzed the clinical practice improvement from the participatory infection control training. The results from FGD(Focus group discussion)II and III showed the changes in determinants of themes regarding improving infection control nursing practice were;

- Education at all levels- Increased awareness, Interested to share and monitor others practice, improved recognition, Sharing ideas, Peer support, improved communication and network
- Individual factors- Increased awareness, Interest to share and monitor others practices, Recognition, Sharing ideas, Peer support, confident, and improved communication.
- Improved participants practice , self knowledge and practice, ability to self learn, and the ability to transfer knowledge to other colleagues.
- Improved self esteem, belongingness to group and power to bring change, more assertiveness, confidence to change infection control related situation and awareness ,systematic problem solving to improve infection control related practice
- Observation /communication of observation will create awareness for a short time, this initial awareness and practice, may help to bring the change up to certain level.

Opinionaire from the key personnel after 1 year and 6moths of the participatory infection control training shows that majority of the key personnel opined that they had clear expectation of the infection control training program(22) and following participation in the program, they find their staffs performance on infection control practices is improved (23), this training helped them to communicate more effectively regarding infection control issues(25), increased their staff's involvement in infection control education and surveillance(20). Finally majority opined that their staff is effective member as they meet their expectations to prevent hospital associated infection in their respective units (24).

The core objective of the present study is to establish a sustained infection control education program for nurses in Indian settings. The results of the present study show that the core group nurses who participated in the participatory infection control training acted as change agent and were successful to enhance educational communication like procedural explanations sharing ideas ,communication to face infection control related problems, decrease negative talks and also established a network to face education related problems.

Clinical improvement process has also been considered more generally as a series of steps to help health workers and managers identify and solve problems of inadequate performance. Thus, this process shows where specific interventions fit into the larger process of managing health workers and health systems. Many of the core group nurses felt that they had improved infection control related clinical practice in their area. The group was able to identify specific issues, and instances where they felt infection control practice had been improved. For example improvement in hand washing, aseptic practices, and decrease in sharp injury, HAI rates and also improved infection control education at all level. This was attributed to the influence of the core group nurses, who had ensured that all staff understood key infection control practice. In addition, some of the core group nurses had produced education material, low cost materials/devises to improve infection control practice. The numerous examples suggest that the core group

nurses have improved the quality of infection control practice. Importantly they appear to be confident in their ability to improve infection control practice. This led to influence others and empowerment, with the ultimate impact of improving quality of infection control nursing practice within the clinical area.

4. Conclusions

The following conclusions were made based on the study findings;

- Why educational programs on hospital infection control are a Herculean task to implement?

The present result showed that the core group nurses not only became change agent to cover the entire nurses' infection control education but also other staff like technical and housekeeping and also supported the educational program for doctors. They established continuing sustainable educational network without any additional cost. They developed indigenous materials and devises to improve infection control related practice. Their communication skills also improved and in one of the hospital the core group nurses are also instrumental in developing reporting network (e -surveillance).

Through participatory training mode, it is possible to train the core group nurses to have self-help by educating and empowering them and also provide education to their colleagues. Participatory training may be more effective than the other methods of education delivery, in terms of cost of mass training, sustainability and acceptance by nurses, thus empowering them to practice infection control.

A self-learning approach by participatory learning helps to develop facilitation of skills, and decision-making abilities, to increase self confidence and self-respect, and thus reduces dependency on others. This research based effort of using participatory infection control training to improve infection control related clinical practice aims to lead to improvements in the quality of care.

The present study showed that the participatory education on hospital infection control was effective in enabling participants to improve their knowledge and practice of infection control. It also facilitated their capacity to train others as change agents thereby improve the clinical practice to reduce infection in the hospital. The participatory training concept appears to offer one approach to organizations who can successfully overcome some of the barriers in implementing infection control theory into practice. However further studies are required to identify if development and empowerment influenced the clinical outcome (patient outcome).

- How to develop an effective and sustainable hospital infection control educational program to empower the nurses working in a selected hospital?

Establishing infection control teams and ongoing surveillance of hospital associated infection is required in majority of the Indian hospitals. The focus group discussion revealed that nurses in this study accomplished significant increase in knowledge of Hospital Associated Infection and were able to find solutions for the problems themselves and change their practices.

The experiences that nurses gained during this research project can be utilized as an ongoing process to introduce clinical practice improvement programs in the organization as a whole. Team effort in

which the most appropriate and best-positioned people are involved in a process of participatory learning can help to bring the practice improvement. The findings can be shared with other organizations that in turn can set up their own educational programs. This experience also helped to sustain practice improvement.

- Will nurses on ward develop ownership and awareness of infection Control activities?

This is concluded by the responses of key personnel. Majority opined that their staffs are effective members as they meet their expectations to prevent hospital associated infection in their respective unit. By attending and teaching infection control classes, helping others to improve practice and participating in surveillance and reporting, they are able to achieve infection control related clinical improvement.

The result of the present study showed that there is continuing infection control education program run by the core group nurses and other nurses who participated in the training. This ongoing training is conducted on voluntary basis. The nurses also participate in surveillance and reporting activities.

- How does the culture of the clinical environment influence infection control practice?

Further, the findings of this study demonstrate that when infection control issues are not embedded in the clinical culture and infection control principles are not entrenched in clinical practice they are considered separately during care activities and easily displaced by other imperatives. Zimmerman and Peta-Anne, (2007) studied the current infection control advice applicable in low- and middle-income countries. Infection control guidelines designed for high-income countries are being utilized by Low and middle income countries, with varying degrees of success mainly because of physical, environmental, and socioeconomic factors. There is a lack of published studies exploring the implementation of comprehensive infection control advice and programs, including the minimal advice, which is designed specifically for resource-limited settings. They also concluded that this must be done in collaboration with those same health care workers who belong to low and middle income group countries. Equally, because of finance and health priorities, health care facilities should choose those interventions most relevant to the needs of their population and workers to prevent infection transmission.

Therefore, it is important to develop a positive and collaborative workplace and system culture; specifically, seek to identify the most appropriate players for each change priority and explicitly support them to learn how to function effectively as a team. Successful workplace cultures talk more about “why don’t we?” and less about “why don’t they” (Ancheril, 2004) the present study experience helped the core group nurses to stretch and push the professional culture congenial to infection control related clinical practice improvement .

The present study demonstrates that delivery of the programme based on participatory learning, led to confidence in the role, a belief in the importance of infection control and a feeling of legitimate empowerment. In turn, this facilitated development of empowered practice and influence at clinical level. This positively influenced clinical practice as demonstrated in the study, and led to increased ownership and motivation of the participants as described in this study.

The study provided an opportunity to think through realistic strategies for change in infection control nursing activities, especially infection control education. Whenever it is possible, researcher kept in touch with participants to offer encouragement and support. An

effort is made to meet them in their work settings. The participants also created a network with their colleagues to support one another in creating change in infection control related activities in their institutions. To date this strategy has been successful in creating awareness in infection control. However to create a significant change in overall practice is still challenging and it is indisputably a collaborative effort. Most clinical practice improvement situations require that context-specific 'knowledge' be produced within the situation, in a time-bound manner. The literature in this area also points out that some of the more relevant human phenomena are not at all amenable to external observation, Most of these approaches seem to focus on creating (or improving) the situation-specific knowledge' that would improve the problem situation(Dash,1999).

Encouraging and allowing people to define their own problems, solve such problems in groups, share experiences, have critical and constructive dialogue, reflect on their own behavior and actions, adopt the inquisitive and critical mind-set, articulate positively effects change for the better, and making them change agents in the process and use their own 'local knowledge', be helpful towards each other. Such awareness and interaction in combination with the organizational support helps to bring about the required clinical practice improvement.

In the present study the information gathered during participatory infection control ranges from passive information providing to self mobilization. The results of FGD connote participant's involvement, decision making and implementing in the infection control program. It has also created an opportunity to interact with each other and generate ideas to improve infection control knowledge and practice.

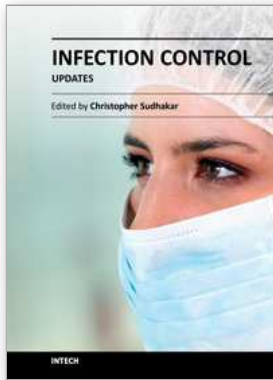
There is no such thing as neutral education ... education either facilitates the integration of generations into the logic of the present system and brings conformity to it, or it becomes the 'practice of freedom', the means by which men and women deal critically and creatively with reality and discover how to participate in the transformation of their world -Freire,1972.

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Health care associated infection is coupled with significant morbidity and mortality. Prevention and control of infection is indispensable part of health care delivery system. Knowledge of Preventing HAI can help health care providers to make informed and therapeutic decisions thereby prevent or reduce these infections. Infection control is continuously evolving science that is constantly being updated and enhanced. The book will be very useful for all health care professionals to combat with health care associated infections.

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