Organizational Learning Review  Applications of Quality Control Circle Method in Hospitals in Taiwan

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The medical care system in Taiwan faced tremendous changes and challenges in recent years, due to a newly-established National Health Insurance policy and a deep involvement of government. Health care industries had their limitation in finance and management. Thus, quality improvement has become important to hospitals, and quality control circle (QCC) was one of the most popular total quality management (TQM) tools used in the Taiwan's health care industries.

Most of the researches in QCC have been focused on performance and leadership, but its application in organizational learning and group learning remained unnoticed. Most of the health care and medical care researches were concerned about the performance of QCC activities. According to Lam et al. (2005), the aim of quality improvement activities was not only focused on efficiency and cost but also concerned about learning and management. Based on their research, most employees thought after participating in QCC activities, they would have higher productivity and competency. And QCC members thought that it brought more opportunity to help them learn, especially on creativity and innovation. Lin et al. (2002) suggested that every modern hospital faced challenges from government and health care environment. For those reasons, TQM and customer satisfaction management (CSM), and quality improvement tool became more and more important in these days. Garvin (1993) also mentions that organizations have been effective in creating or acquiring new knowledge and applying that knowledge to their own activities. Therefore learning organization can improve the motive power, integrate individual knowledge and skills into organizational competence and create competitive advantage. Through the discussion of organizational learning theory and quality theory, the authors in this study discussed the situation of QCC learning and its contribution to hospitals in Taiwan. The authors also provided evidence on that quality control circles can facilitate organizational learning in the quality context.

Statement of the Problem

Since QCC is related to organizational learning and group learning, with this perspective, the aim of the study was to review and examine the association between individual, group, organizational learning and method of QCC. In this study, the authors discussed organizational learning through QCC in health care industry in Taiwan, and identified the association between organizational learning and QCC activities. It is anticipated that the present work can provide a different point of view in quality improvement and organizational
learning theory.

Definitions

This paper discussed organizational learning which defined behavioral learning and cognitive learning where team member could change their thought and behavior after participated in quality control circle activities. According to Crossan, Lance, and White (1999), learning involved different level of individual, group and organization, learning through QCC activities are based on this definition. Learning starts from individual (Wang and Ahmed, 2003), and individual learning outcome from the members of QCC can be integrated to group and organization levels. Organizational learning concepts provide useful ways of thinking about quality control circles and other quality improvement—a more holistic process towards learning suggests that efforts to improve and develop behavioral routines will be more beneficial.

Theory of Organizational Learning

Organizational learning has existed in our lexicon at least since Cangelosi and Dill when discussed the topic over 30 years ago (Crossan, Lance, and White, 1999). Many scholars had different perspectives of organizational learning. For example, Nonaka and Takeuchi (1995) are concerned with knowledge management which involved knowledge and information capture, storage, assessment, usage and evaluation. March and Olsen (1975) explored how the cognitive limitations of managers affect learning. They also specify a theory based on liking, seeing, trusting, contacting, and integrating in an organization. Based on those scholars research, the authors would like to present QCC outcome through the learning perspective.

Crossan et al. (1999) shared some common threads from Nonka & Takeuchi (1995) and March & Olsen (1975), but the domains differ significantly. They were concerned about different phenomena, information process, product innovation, or bounded rationality. Therefore, Crossan and his associates proposed four key assumptions of learning. First, organizational learning involves a tension between assimilating new learning and use what has been learned. Second, organizational learning is multilevel, including individual, group, and organization. Third, those three levels of organizational learning are linked by social and psychological processes: intuiting, interpreting, integrating, and institutionalizing (4I’s). Last, it is about cognition affecting action.

Based on Crossan, et al. (1999), intuiting is the preconscious recognition of the pattern and inherent in an individual experience, such as in QCC activities, the theme of quality goal selection based on members personal experience. Interpreting is the explaining, through words or actions, of an insight or idea to one’s self and to others. As in QCC, team members would try to use their own explanation to others. Integrating is the process of developing shared
understanding among individuals and of taking coordinated action through mutual adjustment. When QCC confirm the mission, members started their quality improvement work on similar concept and understanding. And, institutionalizing is the process of ensuring that routine actions occur, at least the quality improvement outcome might become the organizational regular standard. Through literature review of 4Is and its linkage to QCC, team and organizational learning process revealed a different perspective from past QCC research papers.

**Quality control circle**

In traditional organizations, the quality department has a primary responsibility for quality and tasks that are assigned along functional lines, and specialization is the rule (Garvin, 1988). According to Garvin (1993), continuous improvement programs are sprouting up all over as organizations strived to better themselves and gained an edge. Quality control cycle activities allow people to continually learn how to learn together (Senge, 1990). In Senge’s book, the Fifth Discipline describing learning organizations are skilled at five main activities: systematic problem solving, experimentation with new approaches, learning from their own experience and past history, learning from the experience and best practices of others, and transferring knowledge quickly and efficiently throughout the organization. Wang & Ahmed (2003) reviewed organizational learning, and mentioned, the learning process which reflected in Deming’s quality control system used quality circles, SPC (statistical process control) and PDCA (plan-do-check-action). Murray & Chapman (2003) mentioned one of the pillars of quality management, including range of dynamic concepts from high involvement teamwork and production enablers, to other social and technical capabilities such as innovation techniques. Based on those researches, the authors found some major connection between organizational learning and QCC activities.

In the mid of the 1980s, QCC has been widely used in American health care industries. It started later in Taiwan. And according to Ishikawa (1982), quality control cycles methods were originally developed in Japan primarily for the purposes of industrial education and training. In the research of Blair and Whitehead (1984), they pointed out that QCC activities were not only the training program of attitude and behavior changing, but also the intervention in organization change. QCC teams in hospitals in Taiwan were often to be positioned as a self-managing work team. Self-managing work team effectiveness is defined as both high performance and employee quality of work life. With those perceptive, as a self-managing work team might bring self learning, efficacy outcome, and the authors would present at research finding.

Taiwan Joint Commission on Hospital Accreditation (TJCHA) held the first QCC evaluation and accreditation in 1989. Since then, for most of the hospitals, QCC methods have
been used significantly to emphasize quality improvement and employee development. The major aim of TJCHA was established for hospital accreditation. Therefore, every 2 or 3 years, TJCHA would evaluate health care quality through different dimension. Chung & Pang (2000) reported the first TJCHA evaluation outcome in Taiwan’s health care industries, there were 79.3% well-known enterprise quality activities and about 38.6% of the hospitals already adopted QCC as an usual quality improvement tool, and last there were 36.9% hospitals began to use QCC and other quality improvement tools. (Chung & Pang, 2000).

Methodology

In this study, the authors first conducted comprehensive literature review. The literatures were focused on quality management, quality control circles, organizational learning and health care administration. Secondly, the authors collected empirical studies on hospital quality control circle from 1995 to 2005, including 24 quality control cycles literatures. We used the Chinese journal database in the Taiwan National Central Library to collect those related literatures. Since the implementation of policy of national health insurance in March, 1994, hospitals in Taiwan have focused on ways on controlling cost and increasing operational quality became a major issues of concern. The authors only selected literatures after 1994. By applying the conceptual framework of Crossan et al. (1999), the authors identified four foci of the concept and practices within the existing literature—intuiting, interpreting, integrating, and institutionalizing and their linkage to QCC activities.

Findings

The goal of this research was to better understand the QCC activities that could bring different learning perspectives and behavioral changes. The authors first assorted literatures based on different purposes, then analyzed those QCC activities appearing in the literatures through 4Is, and, lastly, provided different outcome perspective from traditional quality improvement view. QCC team could prove an effective vehicle for organizational learning, because it provides a minimum critical mass for the cross-fertilization of ideas and for developing its own learning norm.

1. Purpose of QCC

After reviewing the empirical data of QCC activities appeared in the literatures available, it was discovered that three approaches dominated in the 24 literatures: process and administration, cost management, and clinical and medical problem solution (see Table 1). First, most of the QCC activities were focused on process and administration management, including process analysis, process improvement, performance appraisal, and waiting time improvement. It is noted that 5 of 17 literatures were concerned about reducing the waiting time. According to Liao & Hsu (1997), most patients’ compliants came from waiting time. Second, medical error
became a very important issue in hospitals and health care industries. Therefore, quality control circles activities could help medical team members review the medical problems and develop methods to correct the medical and clinical errors. Lastly, in 5 articles we found that most of the QCC methods could figure out the fundamental clinical problems in the process of patient caring and treatment, including patient’s health promotion program improvement, intensive care unit infection rate and hospital nosocomial infection problem reduction, and physicians and nurses malpractice improvement.

Table 1. QCC purpose 1995-2005 QCC literatures in Taiwan

<table>
<thead>
<tr>
<th>QCC main purpose</th>
<th>numbers</th>
<th>Content of QCC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Process administration</td>
<td>17</td>
<td>(1)reduce waiting time (2)promote health care delivery process (3)improve medical record review systems</td>
</tr>
<tr>
<td>Cost management</td>
<td>2</td>
<td>(1)medical material cost control</td>
</tr>
<tr>
<td>Clinical problem</td>
<td>5</td>
<td>(1)health care education activities (2)reduce nosocomial infection rate (3)misadventure of medical error</td>
</tr>
</tbody>
</table>

2. 4Is (intuiting, interpreting, integrating and institutionalizing) in QCC activities

As it is summarized in Table 2, 24 articles that talked about health care delivery industries in Taiwan, and how they operated and implemented quality control circles activities through 4Is are summarized. In the stage of intuiting, all of the quality control circle groups could select their theme through team member personal experience and working problems, and only few of the groups were assigned their QCC theme by top mangers and chief president of hospital. When managerial or clinical problems were related to the patients, employees could normally sense the real problems based on patients’ demands. The authors found that most of the team members understood that the purpose of QCC should focus on patients’ true needs. The hospitals in Taiwan used QCC methods to assist them in progressing through two stage. After participating in QCC, the employees would first expose themselves to new ideas, and secondly they would think differently about their nature of work. Therefore, through the organizational learning theories and empirical literature review of quality control circles, it was concluded that when team member could share their thought and experience with their team members and supervisors, they would understand each other and improve their working performance.

In Table 2, almost all of the group members used patient and hospital environment observation, patients complain, brain storming, group meeting, peer review, and survey research to share and explain what they thought, except when they faced the clinical problems. The reason for this might be that the medical problem and patient caring skills are more complicated than other QCC subjects. Therefore when QCC members deal with clinical
problems, they would perform literature and medical record review in interpreting process rather than using the traditional QCC skills. The authors found that most staffs in hospital use QCC for problem-solving, unless there are new technologies or knowledge they were interested to learn.

Table 2 Intuiting and Interpreting Process of QCC

<table>
<thead>
<tr>
<th>Content of QCC</th>
<th>Intuiting Process</th>
<th>Interpreting Process</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Process administration</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(1) reduce waiting time</td>
<td>(a) observation (b) patients experience survey (c) patients complain (d) working problem</td>
<td>(a) experience sharing (b) group meeting (c) brainstorming</td>
</tr>
<tr>
<td>(2) promote health care delivery process</td>
<td>(a) working experience of team members (b) top manager requirement</td>
<td>(a) experience sharing (b) group meeting (c) brainstorming</td>
</tr>
<tr>
<td>(3) medical record review systems improvement</td>
<td>(a) medical peer review (b) working experience (c) top manager requirement</td>
<td>(a) experience sharing (b) group meeting (c) brainstorming</td>
</tr>
<tr>
<td><strong>Cost management</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(1) medical material cost control</td>
<td>(a) observation (b) cost demand</td>
<td>(a) cost efficiency analysis</td>
</tr>
<tr>
<td><strong>Clinical problem</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(1) health care education activities</td>
<td>(a) observation</td>
<td>(a) group meeting (b) brainstorming</td>
</tr>
<tr>
<td>(2) reduce nosocomial infection rate</td>
<td>(a) observation (b) working experience (clinical)</td>
<td>(a) treatment standard setting (b) group meeting (c) brainstorming</td>
</tr>
<tr>
<td>(3) misadventure of medical error</td>
<td>(a) observation (b) working experience (clinical)</td>
<td>(a) treatment standard setting (b) group meeting (c) brainstorming</td>
</tr>
</tbody>
</table>

During the stage of integrating, as summarized in Table 3, QCC members had been trained well of using quality tools, e.g. Parato diagram, fishbone diagram, cause effect analysis, and Deming’s PDCA management tool. The authors concluded from 24 articles that most of QCC members could understand and use those quality tools by doing those QCC activities. According to Chiu, et al. (2001), most hospitals has developed quality improvement activities for many years, therefore employees in hospitals were familiar with those quality improvement tools. Those works contributed positively to individual learning and organizational learning, and team members also felt satisfied and been inspired by QCC activities.
Institutionalizing is the process of ensuring routine actions to occur. In the 24 articles that we had reviewed, 17 articles showed that quality control circles objectives could transfer to the department and organizational regular standard process. There were more than 50% of the articles developing the regular training and teaching courses, especially on new employee education program. In the aspect of process improvement, the authors found that standard process had been established for reducing waiting time in different department of hospitals (including pharmacy departments, outpatient departments, and discharge departments) after QCC activities. However, in the aspect of medical record review, there was no tangible outcome, but most of members believed QCC activities could help themselves grow and learn.

In cost management, two cases accomplished QCC goals, and they also created injection human resource database and job description manufacture text book. Based on Crossan, et al. (1999), the major part of institutionalizing is to develop and create organizational standard. We had similar finding in this review. And, regarding clinical problem, QCC activities could set up the clinical practice guidelines and job description for caring and treating patients. More importantly, the results from QCC activities could also be used to set up orientation and education plan for new staff. According to those articles, the authors found quality improvement activities could help team members solve clinical problem, and decrease medical and clinical error. At last, we found most of QCC members could develop future theme of QCC activities, therefore institutionalized learning had transfer knowledge and experience from individual to groups and from groups to organizations. Even though it is still a long journey for organizational learning but it is very important to the organization.

Table 3 Integrating and Institutionalizing Process of QCC

<table>
<thead>
<tr>
<th>Content of QCC</th>
<th>Integrating Process</th>
<th>Institutionalizing Process</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Process administration</strong></td>
<td>(1)reduce waiting time (a)Parato diagram (b)Fishbone diagram (c) cause effect analysis (d)PDCA</td>
<td>(a)standard process text book (b)setting check list</td>
</tr>
<tr>
<td>(2)promote health care delivery process</td>
<td>(a)Parato diagram (b)Fishbone diagram (c) cause effect analysis (d)PDCA</td>
<td>(a)build up standard operation process (b)set teaching program (c)job description</td>
</tr>
<tr>
<td>(3)medical record review systems improvement</td>
<td>(a)Parato diagram (b)Fishbone diagram (c) cause effect analysis (d)PDCA</td>
<td>None</td>
</tr>
<tr>
<td><strong>Cost management</strong></td>
<td>(1)medical material cost control (a)QFD (b) cause effect analysis (c) PDCA</td>
<td>(a)build up standard operation process</td>
</tr>
<tr>
<td><strong>Clinical problem</strong></td>
<td>(1) health care education activities (a)Parato diagram (b)PDCA</td>
<td>(a)build up standard operation process</td>
</tr>
</tbody>
</table>
3. Contradistinctive outcome from traditional quality improvement perspective

In the past, most of the researches were focused on performance and outcome management in the perspective of quality improvement. In this review, the authors thought quality control circles and quality improvement tools are not limited to performance appraisal, Yang, et al. (2002) also found that quality improvement could help individuals, groups and organizations growth. With supervisor support and participation of group members, QCC activities provide learning opportunity for each employee in hospitals. Through the perspective of organizational learning, the QCC method, in terms of 4Is, does not just meet the quality performance but also help developing social and psychological purposes for employees. Most of the QCC activities embraced invisible and tangible outcomes, even QCC activities could not reach their group goal completely, but they still allowed the team member to be socially and psychologically satisfied. Therefore, we found that through organizational learning perspective to analysis QCC activities could be more critical and refreshing thinking than from the traditional ways. In Garvin (1993) which is concerned with transferring knowledge its behavior to reflect new knowledge, in such perspective, QCC activities could transfer personal knowledge and experience through 4I’s process to interpret learning outcome. And last, one of the QCC objectives which is continuous improvement, continuous improvement is important to organizations, because it is one of the foundation for organizational capacity, therefore the authors believed, if we liked to study quality improvement theories and empirical studies then we should focus on different research perceptive instead of performance and outcome research.

Discussion

Hospitals in Taiwan faced the environment change at present days, QCC method was one of the organizational learning development tools to make employees to learn and think voluntarily. Some of the researches showed that the QCC was a dynamic process, and, in the research of Blair and Whitehead (1984), it was pointed out that the QCC activities were not only the training programs of attitude and behavior changing, but they were also the interventions in organizational change.

<table>
<thead>
<tr>
<th>(2) reduce nosocomial infection rate</th>
<th>(a) Parato diagram (b) PDCA</th>
<th>(a) build up standard operation process (b) set teaching program</th>
</tr>
</thead>
<tbody>
<tr>
<td>(3) misadventure of medical error</td>
<td>(a) Parato diagram (b) PDCA</td>
<td>(a) build up standard operation process (b) set teaching program</td>
</tr>
</tbody>
</table>
Learning organization creates continuous transformation and improvement through the learning activities of all its employees (Pedler et al., 1991). First, the QCC activities in the health care industries could improve the medical and clinical quality; integrate personal and group knowledge, and skill of using quality control tools in the group and organization. In addition, QCC activities could improve competence and increase competitive advantage of health care industries which showed in individual, group, and organization levels. Based on those researches we found, quality control circles could make employees think and act actively. For example, many group and department members found problems of patients and working place by their personal experience. Second, QCC gave employees an opportunity to share their concerns and understanding of working experience and environment through brainstorming and group meeting in interpreting process. When QCC members had similar concept for quality issues, this could help them integrate their thoughts and ideas systematically. Third, while QCC members were in the integrating process, they could draw important learning outcome, and most of the QCC members could use quality improvement tools wisely. QCC member liked to share their learning experience with new staffs and team members (Chiu, et al., 2001).

Last, part of the QCC theories was used to modify work flow or develop employee skills, which resulted in institutionalizing process that would eventually become the organizational regular standard working process, which could also be developed as the training and teaching courses for future working activities. Hence, QCC activities could encourage individual members to develop more creativity on their daily works and also transfer into group innovation capability. The above evidences showed that QCC method could increase organizational performance, and improve the attitude and behavior for patient caring.

Organizational learning needs to focus on linking learning with organizational performance and motivation of employees. Learning organization could improve the active power of employees, integrate and share personal knowledge and transfer them into group and organizational competence, and develop competitive advantage for organization. Therefore, the concept of learning organization share the same objective with quality improvement, that is, to made people learn. The authors reviewed 24 articles, we found most quality control circles members not only can achieve individual goals and group learning, but also receive invisible benefit from enriching the social relationship such as concerning about team member outside of work place and increasing group centripetal force. In this review, the authors had not have the chance to interview the QCC members personally or join their QCC activities, therefore for the future study, the authors suggested that by actually participating in the QCC activities will enhance our understanding of learning process. The authors only collected published articles on Taiwan National Central Library Chinese journal database, we believe there were many hospitals and health care organizations had more QCC activities which had been not published.
Taiwan Joint Commission on Hospital Accreditation (TJCHA) held many contests of quality improvement, it might be an interesting source for future researchers.

**Recommendations**

Based on the conclusions, we believed that organizational learning in health care industries research field had lots of potential and opportunity. First, in clinical and managerial practice, through continuous quality improvement (CQI) and total quality management (TQM) which can help employee reinforce their personal working ability, skill and knowledge. This can help group members become an automatic learner. Second, from the performance research perspective might help organizations to develop appraisal system, but the individual and group learning is also important to organizations. Third, most of employees could through quality control circles activities to learn and inspire new idea of quality theme and it was the important competence for organizations. In this review paper, the authors were only reviewing literatures through cross section research, it is hope which this paper will encourage future empirical work in examining of quality control circles and other quality improvement activities could use different perspective of depth analysis of quality activities.

**Implications to HRD**

The QCC activities may have well contributed to organizational learning, because when employee participated in activities for quality management, they would reveal to new concepts and ideas, expanded their knowledge of quality issues. And the same time, QCC activities could encourage hospital workers to think differently about their jobs, and make team member to change their working attitude and behavior. For human resource management and development practitioners, those QCC activities needed more motivation to encourage employee participation, therefore successful implementation of organizational learning and QCC requires an effective physical incentive program, and facilitate each individual to create and maintain quality improvement motivation which needs more internal reward. Good motivation include internal and external reward, therefore human resource management department should pay more attention about internal reward ,such as organizational learning outcome and external reward, including salary, performance appraisal system in health care industries. For HRD scholars and researchers, according to Wang& Ahmed (2003), they presented five learning concept which are individual learning, process, culture, knowledge management and continuous improvement. Learning involves different concepts, no matter in which part of learning, each organization and employee should need more creativity and innovativeness in every ways.

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