CHAPTER 2

LITERATURE REVIEW

This chapter presents a literature and research review in three major parts. In the first part, the theoretical and research literature related to nursing care for non-surgical stroke elders is discussed. The second part addresses the theoretical basis of nursing care quality, quality indicators and quality of stroke care. The third part deals with methodologies used for developing indicators.

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Nursing care for non-surgical stroke elders

In this part, the definition of a stroke, the impact of stroke on the elderly patient, then nursing and non-surgical stroke elders care are considered.

Stroke

The traditional definition of cerebrovascular disease or stroke was offered by World Health Organization in 1970 as a 'neurological deficit of cerebrovascular cause that persists beyond 24 hours or is interrupted by death within 24 hours' (Wikipedia, 2007).

Stroke is a syndrome characterized by a sudden or gradual onset of neurological deficits caused by a compromise of the blood supply to part of the brain (Harrell, 1997). Stroke occurs when the blood flow to the brain is suddenly blocked, and the blood supply to the brain is suddenly disrupted. This causes the affected area

to stop functioning and this brings about neurological damage to the patient (The Stroke Center at Abington Memorial Hospital, 2004).

Stroke can be classified into two major categories: ischemic and hemorrhagic (Nicoletta et al. 2004; Wikipedia, 2007). Ischemia can be due to thrombosis, embolism, or systemic hypoperfusion. Ischemic stroke or cerebral infarction is a more common form of stroke. Ischemic stroke occurs when the cerebral blood vessel becomes occluded and the blood supply to part of the brain is totally or partially blocked. Deprived of oxygen, the brain cell is injured and dies. This type is found in more than 85% of stroke patients and 70-85 % of elderly patients are diagnosed as having suffered ischemic stroke (Charnnarong, 2006; Meesuk, 2005; Srithares, 2003).

Hemorrhagic stroke or cerebral hemorrhage can be due to intracerebral hemorrhage, subarachnoid hemorrhage, subdural hemorrhage, or epidural hemorrhage. Hemorrhagic stroke occurs when blood vessels burst, causing blood to pool around or inside the brain (Suttipong, 2006).

In Thailand, as is the case with other countries, most elderly stroke patients suffer from ischemic strokes rather than hemorrhagic strokes (Charnnarong, 2006; Meesuk, 2005; Puangwarin, 1998; Srithares, 2003).

The impact of stroke on the elderly patient

In general, stroke creates many burdens on patients at every age. However, strokes have greatest impact on elderly patients, and bring about physical, psycho-social, and spiritual problems (Bhalla et al. 2004; Eldar et al. 2001; Hilton, 2002; Smeltzer & Bare, 2000; Stanley & Gauntlett, 1999).

Physical problems

The severity of physical problems or physical change is dependent on the size and the area where the abnormality takes place whereby the blood vessels or brain tissues have received an inadequate blood supply. The common physical problems are movement disorder, eating disorder, excretion disorder, cognitive disorder, communication disorder, sensory loss, and perception disturbance.

Movement disorders occur from the lack of blood supply to the upper motor neurons of the anterior or middle cerebral brain that lead to frontal cortex infarction, which causes a loss of voluntary control and over motor movement (Smeltzer & Bare, 2000). The most common motor dysfunctions are hemiplegia, and hemiparesis. Hemiplegia is a paralysis of one side of the body, while hemiparesis is weakness of the body; either of them may affect only the face, an arm, or a leg or might affect one entire side of the body and face. However, complete hemiplegia affects half of the face and tongue as well as the arm and leg on the same side of the body (Chin, Finocchiaro, & Rosebrough, 1998). Stroke patients may have spasticity, unco-ordination, muscle weakness, and motor dysprexia (Anderson, 1990). In addition, motor loss causes some degree of functional disability to the patient, particularly functions relating to daily life activities, such as disability in self care, and mobility (Beare & Mayers, 1994). The patients are usually unable to carry out the basic activities of daily living, such as bathing, oral care, dressing, eating, and using the toilet (Hafsteinsdottir & Grypdonckl, 1997).

Eating disorders happen in stroke patients who have problems related to bilateral or brainstem lesion, severe dysarthria, or other evidence of cranial-nerve

dysfunction (Coletta, 1994). Stroke often leads to difficulties in eating, including chewing problems, dysphagia, aspirate, and denial of eating difficulties (Finestone, Finestone, Wilson, & Teasell, 1995). Subsequently, the problems of dehydration, malnutrition, and aspiration pneumonia occur. There is evidence suggests that 60% of deaths in stroke patients are caused by pneumonia (Lugger, 1994).

Excretory disorders occur from neurological deficit in the cerebral cortex area. The causes of urinary incontinence after stroke are functional limitation, urinary tract infection and fecal impaction and drug effects. Most elderly stroke patients experience urinary intension, urinary incontinence and urinary frequency. During hospitalization, some need to retain a catheter which leads to several complications such as cystitis, bladder stones, and urinary tract infection. After spontaneous voiding returns, it is important to be concerned about bladder training. Stroke patients are very frequently faced with constipation, and fecal impaction which is common after strokes from dehydration, malnutrition, immobility, and medication effects (Bronstien, Popovich, & Stewart-Amidei, 1991; Coletta, 1994).

Sensory loss may take the form of minor impairment of touch or may be more severe with loss of proprioception in stroke patients. Sensory loss includes: hemi anesthesia - loss of sensation; parathesia - a feeling of heaviness; numbness; tingling; and loss of muscle-joint sense, which causes proprioception (proprioception is the ability to perceive the relationship of the body parts to the external environment); and postural sense disturbance. This may affect the ability to walk because of lack of balance control and inappropriate movement. Hence, the risk of falling is high in this group (Black, Hawks, & Keene, 2001). In addition; sensory loss causes the stroke

patient to be faced with more difficulty in interpreting visual, tactile, and auditory stimuli (Schnell, 1993; Smeltzer & Bare, 2000).

Perceptual disturbances are the effects on abilities to interpret sensation. Stroke results in homonymos hemianopia, visual agosia, and disturbance in perception of visual-spatial relations. Hemianopia is defective vision or visual loss in the same half of the visual field of each eye, with the patient able to see only through the use of one half of his normal vision; this may be a temporary or a permanent condition. In addition, the stroke patient may develop visual agosia, which is defined as a failure to recognize or attach meaning to the objects with which they are familiar. Moreover, disturbances in visual-spatial relationships or disturbance in perceiving the relationship between two things is frequently found in stroke patients (Chin et al. 1998; Smeltzer & Bare, 2000).

Cognitive impairment in each patient depends upon the area of damage. The left hemiplegic patient may often experience visual motor perceptual impairment, loss of visual memory, left side neglect, poor insight and judgment. The patient may retain verbal ability but lack the ability to understand insights into the problem. The right hemiplegic patient is incapable of communicating effectively with a reduction of vocabulary and auditory retention span. If damage has occurred to the frontal lobe, this may have an impact on learning capacity, sensory or other higher cortical intellectual functions, such as confusion and dementia (Chang et al. 2003; Smeltzer & Bare, 2000).

Communication disorders including an impairment of speech production, may bring about communication difficulties. There are many types of communication difficulty, such as aphasia or dysphasia. Aphasia is a defect in using and interpreting

the symbols of language which may involve speaking, reading, writing, and understanding language. However, dysarthria is imperfect articulation, which means that the stroke patient can understand language but has a problem with articulation (Chantawatchai, 1999; Smeltzer & Bare, 2000).

Other complications

According to Covinsky et al. (1998) and Harrell (1997), several serious problems such as physical de-conditioning, health functional decline, contractures, shoulder problems, falls, nasocomial infection, sensory deprivation, and drug toxicity may increase dependencies that eventually lead to long term care in elderly patients.

Psychosocial problems

As a consequence of the disease, the elderly with stroke usually experience hemiparesis, and problem with swallowing, communication, urination and defecation. The elderly with these symptoms is unable to independently conduct daily life activities and become dependent on providers and family members, for their basic needs (Lincoln, Francis, Lolley, Sharma, & Summerfield, 2003). Being dependent, the elderly would be likely to face with fear, anxiety, and depression. This condition induces psychological problems. In addition, psychological disorders could be caused by insufficient blood supply that affects the patient's coping pattern, and brings about the need for the presence of strong social and economic support.

According to Smeltzer and Bare (2000), most stroke patients often have psychological crises during hospitalization and within 6 months to 2 years after a stroke. Depression, a common emotional disorder, may affect 40% of all stroke

clients (Koenig & Studenski, 1998; Robinsion, Murata & Shimoda, 1999). Depression is a frequent psychological problem in elder stroke, which leads to mood related sign, such as emotional disturbance, sadness, tearfulness, fatigue, frustration, and poor self image. The others common symptoms of depression may include behavioral disturbance, cyclic function problem, and ideational disturbance (Alexopoulos, Abrams, Young, & Shamoian, 1998). Some elderly stroke patients have to deal with family withdrawal problems (Chang et al. 2003; Covinsky et al. 1998; Harrell, 1997).

With respect to social problems, stroke also creates problems for a patient's social role. Having experienced physical limitations, elderly could lose his/her self-esteem and self-confidence as they may not be able to maintain his/her roles (Thongtang et al, 2002).

Additionally, stroke places a significant burden on the family particularly spouse or family members who look after the patients (Rosenthal, Pituch, Greninger & Metress, 1993; Wojner & Anne, 1996). Caregivers have to deal with stroke patient's difficulties in mobility, self care, communication, cognitive impairment, depression and personality change (Registered Nurses' Association of Ontario, 2005).

Spiritual problems

Religious belief and practice are common among older adults. Once one has physical illness, religion and spirituality could be essential for coping. An elderly stroke victim could lose his/her spirit, life goal, and identity (Pargament, 1997; Stanley & Gauntlett, 1999; Hilton, 2002).

May and Mackenzie (1999) explored the need of Chinese elderly patients following a stroke. They found the spiritual problems occur in every phase of a stroke and the spiritual need was important at all stage of recovery. These can be regarded as the need for religious support and the need to carry out the usual rituals within physical limitations.

The rituals needed to maintain religious beliefs were usually simple, including praying, reading religious books, burning the sticks and going to church. Aldridge (2006) explored the depression of stroke survivors. The results showed that the patients with strong spiritual beliefs appear to suffer from less emotional distress after surviving a stroke. In addition, the finding suggests that spiritual or religious beliefs really do help people cope after a stroke.

In conclusion, elderly stroke patients are burdened with a range of problems, including physical, psychological, social and spiritual ones, all of which require effective nursing care.

Nursing and non-surgical stroke elders care

Stroke often has devastating effects on the patients and caregivers, and the demands on professionals and the impact on the health care system can be enormous (Zwygart-Stauffacher et al. 2000). In this section, the nursing role in stroke care and nursing care for non-surgical stroke elders are discussed.

Nursing role in stroke care

There are many studies about nurses' roles in the care of hospitalized stroke patients, but there are few studies related to the nurse's role in the care elderly stroke patients. The popular operational and conceptual framework that is frequently put forward in the study of stroke care in the elderly group is the Unified Perspective one (Kirkevold, 1997). The four integrated functions of nurses in acute stroke care are: 1) the interpretative function - the nurse's role in educating and supporting the patient and family; 2) the consoling function - the nurse's role in supporting the patient and family through emotional trauma, maintaining hope, and preventing depression; 3) the conserving function - the nurse's role in preparing and assisting the patient to be as fit as possible in order to complete the practices associated with the rehabilitation program; and 4) the integrative function - this is seen as the translation function whereby the nurse is needed to function in many situations related to the needs and the future daily life activities of patients and families, such as getting out of bed, eating, using the toilet, and participating in social interactions.

Nursing care for non-surgical stroke elders

The three major goals of stroke care after the onset of stroke in elderly patients are maintaining life, preventing complications, and promoting recovery (Eliopoulos, 2001).

Nurses who are in attendance at the patient unit 24 hours a day are accepted as the main contributors to all phases of stroke care (Lin, Wendy, & Sharon, 2004).

Nursing care for stroke patients is divided into three phases: the acute phase, the post-acute phase, and the rehabilitation phase (Burrell, 1992; Chantawatchai, 1999; Monahan et al. 1994: Smeltzer & Bare, 2000).

Firstly, in the acute phase, twenty four hours after the stroke attack, nursing care focuses on stabilizing patients, maintaining vital functions, providing for survival, and preventing more brain damage. Nursing activities in this phase include: maintaining adequate oxygenation; monitoring vital and neurological signs; monitoring intake-output and electrolyte; preventing aspiration; administering medication; and giving information. The expected patient outcomes in this phase are the absence of cyanosis, normal breathing sound, normal arterial blood gas, and no aspiration.

Secondly, in the post-acute phase, within forty eight hours after the stroke attack or after the vital and neurological signs become stable, nursing care aims to prevent possible numerous complications. These include complications from disease, immobility, dependency, and loss of functions. Nursing activities in this phase include: monitoring vital signs and neurological signs; preventing aspiration; improving mobility; preventing joint deformities; changing positions; providing hygiene care; retraining bowel and bladder control; encouraging patient participation; providing fluids and nutrition; maintaining skin integrity; and preventing injury. The expected patient outcomes in this phase should result in no aspiration, a demonstration of improved mobility, normal skin turgor and joint deformities, and freedom from injury and urinary tract infection.

Lastly, during the rehabilitation phase, nursing care starts with the first assessment upon admission and continues until the patients have been stabilized and

reached their maximum level of functioning. Nursing activities in this phase involve: establishing exercise programs; enhancing self care; improving communication; helping the patient and family to cope; educating patients and families; and preparing for continuing care. The expected patient outcomes in this phase are demonstration of being able to successfully communicate, self care improvement, being ready to be discharged, stress decrease, and an absence of secondary complications.

According to O'Conner (2000), the two themes of nursing interventions in the rehabilitation phase are providing direct care and continuing care. Direct care is composed of three categories which are general care, specific care, and rehearsal care. Firstly, general care comprises hygiene care, skin care, and nutrition care. Secondly, specific care is care of relatives, psychological care, and continence care. Thirdly, rehearsal care is the role of nurses as primary agents in carrying on the rehabilitation care. Similarly, continuing care is the care that nurses give as part of the twenty four hour bedside care. Activities that are included are continual assessment and teaching patients and families.

In general, the principal management of cerebral infarction consists of management of risk factor, medical treatment i.e. thrombolysis, anti-platelets therapy, the general supportive treatment and the rehabilitation program (Charnnarong, 2006; Takahiro & Yoshihiro, 2006). According to Roberston and Mackinnon (2002), most elderly patients are susceptible to the drug toxicity; therefore drug alert prevention is needed for this group.

Furthermore, not only do elderly stroke patients need nursing care, but their families also need nursing care. From the research reviewed regarding the needs of the stroke patients' spouses and families, issues mentioned included the need for

information, counseling, interaction, financial support, facilities, and accessibility (Rosenthal et al. 1993; M.E. van der Smagt-Duijnstee, Hamers, Abu-Saad, Zuidhof, 2001).

Nurses should assess the family's emotional state before planning the intervention and allowing them to participate in caring for the patient. Furthermore, nurses should assess the family's needs and develop nursing interventions for them (Hafsteinsdottir & Grypdonck, 1997).

Therefore, in order to provide quality care, nurses should understand the problems and the needs of elderly stroke patients and their families, which include physical aspects, psycho-social aspects, spiritual aspects, and family care.

In many countries, after stroke attacked, most stroke patients were admitted to stroke unit for intensive care. In Thailand, Siriraj Hospital, Chulalongkorn Hospital and the Prasat Neurological Institute are three hospitals that have stroke units, whereas other hospitals do not. In addition, not one hospital has a specific in-patient unit for the elderly group. Most hospitalized elderly stroke patients are admitted into medical units, or multipurpose wards in both regional and general hospitals.

To conclude, most non-surgical elderly stroke patients in Thai hospitals are admitted to the medical wards.

Theoretical basis of nursing quality, quality indicators and quality of stroke care

In this section, the theoretical basis of nursing quality, the theoretical foundation of quality indicators, and quality of stroke care are discussed.

The theoretical basis of nursing quality

In this section the definition of quality, quality in health care and nursing care system, the ontology and epistemology of nursing care quality, and quality care assessment are presented.

The definition of quality

The word quality comes from the Latin word ‘qualitat‘, which means ‘a peculiar and essential character and inherent feature’ (Merriam-Webster Online, 2005). Webster’s Dictionary defines “quality” as any of the features that make something what it is; a characteristic element; attribute or the degree of excellence that a thing possesses (Neufeldt & Guralnik, 1994).

The definition of quality varies with context. There are many divergent definitions and characteristics of quality. Traditionally, quality in industry is associated with: conformance to requirements: matters completed on time: absence of processing complaints: providing what customers require: fitness for use: and getting what is expected. Quality in terms of a product means that it is well made, or the product or service is excellent (Richardson, 1997).

There is general agreement worldwide that high quality in products and services is important for the competitive market in a global society (Richardson, 1997). In industry, quality is the result of the pressures of the marketplace and consumers’ demands, so that products or services are constantly improved. The quality philosophy movement was broadly accepted in the industrial world after the economic revolution and particularly by the mid-nineteenth century. At that point many business institutions were convinced that providing quality products and

services was the chief way to succeed economically so they attempted to improve the quality of the services and products that they offered (Richardson, 1997). As a result many quality concepts, such as quality control, quality assurance, quality assessment, quality measurement, quality management, and total quality management, have emerged and become broadly accepted.

Quality in health care and nursing care system

In health care systems, the quality issue has been present for a long time. A vast amount of literature credits Florence Nightingale (Al-Assaf & Schmele, 1997; Idvall, 2001; Richardson, 1997) with developing a standard of infection control in nursing care, from the year 1863, and using statistical tests to evaluate the care provided to the soldiers during the Crimean War. Her work reduced the mortality rate of sick and wounded soldiers. At that time, Nightingale's studies tested the correlation between hospital death and disease. Her work also extended to test the correlation between outcome indicators with sanitation and unsafe environments. After that, the clinicians continued to assess the correlation between care and outcomes of care (Al-Assaf & Schmele, 1997). Therefore, Nightingale has been identified as the first person whose pioneer work helped to improve the quality of care in both documentation and the health service (Al-Assaf & Schmele, 1997; Idvall, 2001; Lang & Clinton, 1984; Shaungnessy, Crisler, Schlenker et al. 1994).

In health care systems, the quality of care is defined as the degree to which patient care services increase the probability of desired patient outcomes and reduce the probability of undesired outcomes (Donabedian, 1966; JCAHO, 1993).

Moreover, quality care can be viewed differently by different people (Masso, 1989). Patients often define quality care in terms of convenience and service

expectations. Providers define quality care in terms of process and outcomes. Administrators define quality as “no complaints” and cost effectiveness. Researchers typically evaluate quality care by assessing the structures, processes, and outcomes of care (Ferran, 2001).

In health care systems, as in other professional fields, nurses are legally liable and morally responsible for the quality of care that is provided to patients. It has been demonstrated that the care given by nurses can affect mortality rates and patient outcomes (Gunther & Alligood, 2002; Sung-Hyun, 2001).

Traditionally, nursing care quality has been defined and evaluated from the nurses’ perspective. For instance, nursing care quality can be seen as a process which seeks to achieve the highest excellence in the delivery of care for patients (Lang, 1976),

However, more recently definitions of nursing care quality, its attributes, and instruments used for its measurements have switched from the nurses’ perspective to the stakeholders’ perspective, such as those of patients and their families (Leinonen, Leino-Kipi, & Jouko, 1996). For example, nursing care quality based on the patient’s and family’s perspective is defined as the degree to which nurses meet the values and expectations of the patients and their families (Change, 2001).

The ontology and epistemology of nursing care quality

According to Gunther and Alligood (2002), the nature of nursing care quality can be explained in both ontological and epistemological terms. Ontology deals with whether nursing is a science or an art, whereas epistemology considers ways of knowing and the structure of knowledge (Fry, 1992).

From the ontological view, nursing care quality is a science and is based on theory. Using the assumption of many philosophers as a base, quality can be defined and measured (Katz & Green, 1992). Currently, many reliable and valid scales using numerous variables attempt to measure the quality of nursing care. For example, physical and psychosocial status is usually included in the outcome dimension, while educational skill and the discharge planning process are usually included in the aspects of the nursing care process (White, 1972).

From the epistemological standpoint, Gunther and Alligood (2002) suggest that enlightened nursing care quality is based on Fawcett's structural hierarchy for nursing knowledge, which includes the four meta-paradigms of nursing: the person, environment, health, and nursing (Fawcett, 2000). Within Fawcett's structural hierarchy of contemporary nursing knowledge, the meaning and the experience of nursing care quality lies in the meta-paradigm proposition, one that links the person, the environment, health, and nursing action (Gunther & Alligood, 2002).

Quality care assessment

Quality care assessment is the systematic monitoring of processes that identifies opportunities for improvement in patient care delivery, thereby designing ways to improve the service. This approach continues by evaluating follow-up actions to make certain that improvement occurs (Koch & Fairly, 1993). In addition, the assessment of the quality of care is the responsibility of all providers because it leads to the improvement of the quality of care (Idvall, 2001).

There are several frameworks that can be used for the assessment of the quality of care, but the most popular and best-known is the one featuring the classical quality aspects proposed by Donabedian (1966; 1980; 1988).

Using systems theory, Donabedian (1980) identified three well-known categories for the assessment of the quality of care, namely structure, process, and outcome. Firstly, the structure category represents the attributes of the setting in which care occurs. It includes: the material resources, such as facilities, equipment, and money; human resources, such as the number and qualifications of staff; and the organizational structure, such as the medical staff organization, methods of peer review, and methods of reimbursement. The classical quality assessment model identifies the attributes of the quality of nursing care that relate to the structure category as skill mix, staffing levels, staff characteristics, social climate, time, and workload (Donabedian, 1980).

Secondly, the process category represents the activities which the provider and the client perform in giving and receiving care. It consists of the patient's activities in seeking care as well as the practitioner's activities in giving care, such as making a diagnosis, and recommending or implementing treatment. There are two elements in the performance of providers: technical and interpersonal relationships. The technical depends on the knowledge and judgment of the providers, and interpersonal relationships are the interactions between the providers and the patients and family. Interpersonal relationships are the vehicles on which successful care depends (Donabedian, 1988). The attributes that relate to the process category are implementing physicians' orders, support of initiatives, the communication process, physical interventions, and the discharge planning process (Attree, 1993; Hogston, 1995; Leinonen, Leino-Kipi, Stahlberg, & Lertola, 2001).

Lastly, the outcome category represents the effects of care on the health status of patients and the population. Improvement in the patient's knowledge and valuable

changes in the patient's behavior are included under the broad definition of health status, and so is the degree of the patient's satisfaction with care. In addition, most quality of nursing care attributes usually reflected in the outcome category are complications that occur, mortality and mobility rates, patients' health status, the progress made in the nursing process, and patient and family satisfaction (Phaneuf 1964; White, 1972 cited in Chang et al. 2003).

There are three general methods used to assess the quality of care: implicit review, explicit review, and the use of sentinels. Firstly, implicit review refers to the process of using experts, or in some cases, groups, who are able to recognize good care when it takes place. Secondly, explicit review involves identifying specific criteria to assess care, review records or observations, and to check the degree to which what takes place conforms to these criteria. Lastly, the use of sentinels is a method that identifies classes of unacceptable events or 'red flags' to indicate unsatisfactory situations and events (Berwick & Knapp, 1987). In using these general methods, the most significant tool used in quality assessment is the quality indicator.

The theoretical foundations of quality indicators

In this section the following are discussed: the definition and historical usage of nursing quality indicators; the advantages of quality indicators; types of quality indicators; the characteristics of quality indicators; the types of events and level of care measured by quality indicators; the important aspects of care and threshold parameter of quality indicators, and nursing quality and quality indicators used in Thailand.

Definition and historical usage of quality indicators

An indicator is a quality tool that provides quantitative measurement, and can be used as a guide to monitor and evaluate the quality of a product or service. A set of quality indicators is used to objectively measure performance during processes that include events, occurrences, and aspects of treatment. These measures may offer specific information about the quality of a particular kind of care or service. These measures can be related to either the process or outcomes of care. They also refer to constructs such as the attributes of care that can be used to determine the quality of care (Rantz, Miller, Popejoy, & Zwygart-Stauffacher, 2000; Shaungnessy et al. 1994).

According to Lawrence, Oleson and et al. (1997) a quality indicator is different from a guideline, a review criteria, or a standard. It is a measurable element of the performance of a practice for which there is evidence or consensus. Thus, the indicator can be used to assess the quality of care, and hence later change the quality of care provided. On the other hand, guidelines consist of a systematically developed statement. These are used to assist the practitioner and patient to make decisions in specific clinical circumstances, and, in essence, it tells them the right thing to do (Forrest, Hoskin, & Hussey, 1996). As well, standard is the level of compliance with a criterion indicator. A target standard is set prospectively and requires a level of care that provides must strive to meet. An achieved standard is measured retrospectively and details whether a care provider met a predetermined standard (Campbell et al. 2002; Lawrence et al. 1997)

JCAHO (1993) defined quality indicators as valid and reliable quantitative measures of processes or outcomes related to one or more aspects of performance, such as the effectiveness of an action. In addition, indicators have a statistical value

that may provide an indication of the condition or direction over time of an organization's performance in relation to a specific outcome. In the year 2005, JCAHO further explained that a quality indicator is not in itself a direct measure of the quality of care, but it acts as a screening tool or reference point for monitoring, evaluating, and improving care.

Quality indicators were first drawn up in the fall of 1986. At that time, JCAHO initiated a quality project called the Agenda for Change. In this project quality indicators were developed that were based on four basic concepts of health care quality assessment and improvement. The four concepts were: 1) patients' outcomes are influenced by all activities of the health care organization; 2) continuing improvement in the quality of care is the ultimate goal; 3) accreditation standards should focus on key functions of the organizations; and 4) accreditation will be enhanced by monitoring the actual performance of health care organizations (Katz & Green, 1992; Nadzam, 1991).

Subsequently, in the year 1995, the American Nurse Association (ANA, 1995) proposed twenty-one nursing indicators to measure acute care quality based on the classical Donabedian framework (Donabedian, 1966). Firstly, the components of the structure category are: the ratio of total nursing staff to patients; the ratio of registered nurses to total nursing staff; the qualifications of the registered nurse staff; total nursing care hours per patient; staff continuity; and registered nurse overtime. Secondly, the components of the process indicators are: assessment and implementation of patient care requirements; pain management; maintenance of skin integrity; patient education; planning for discharge; assurance of patient safety; and responsiveness to unplanned patient care needs. Lastly, the components of the

outcome indicators are: mortality rates; length of stays; adverse incident outcomes; complication rates; patient/family satisfaction with nursing care; adherence of patients to discharge plan; readmission rates; post-discharge emergency room visits; patient knowledge; and nurse satisfaction.

After that in the year 1996, the American Nurse Association constructed the Nursing Report Card for acute care settings, which lists ten indicators. These were: the mix of registered nurses and unlicensed staff; total nursing care hours per patient per day; maintenance of skin integrity; nurse satisfaction; falls by patients; nosocomial infection; patient satisfaction with nursing care; patient satisfaction with pain management; patient satisfaction with educational information; and patient satisfaction with overall care. Today, the Nursing Report Card is being used by several organizations and the reports on the lessons learned from the ANA indicators have been distributed worldwide (ANA, 2000; Jennings, Loan, DePaul, Brosch & Hildreth, 2001; Rowell, 2001).

As matters stand, the amount of nursing research related to the development of nursing quality indicators has gradually increased for both general and specific care. For instance, Skews, Meehan, Hunt & Armitage (2000), developed clinical indicators for mental health nursing practices in Australia. Idvall (2001) developed strategic and clinical quality indicators for postoperative pain management in Sweden. O'Brien et al. (2003) developed mental health nursing clinical indicators in New Zealand.

In conclusion, a quality indicator is a statement or a quantitative measure that can be used to specify the effectiveness and the appropriateness of specific processes or activities and may be developed for assessing the quality of care.

Advantages of quality indicators

There are numerous advantages to be gained from using quality indicators in the nursing discipline in relation to providing care for patients. Quality indicators provide the following benefits: 1) research - data related to patient outcomes can be collected to study the effectiveness of treatment, and data collected about service structures and activities can be used to study the links between outcomes and service organizations; 2) clinical improvement - health care providers can compare current results with those of previous years and/or with similar services and thus assess the effects of changes, or discover why others obtain better outcomes; 3) referral systems and promoting patient choice - patients and their referrers increasingly need important information, such as waiting times and outcomes of treatment, in order to make decisions about whether to receive or refuse treatment; 4) resource management - purchasers and health care providers need to have data about quality, costs and the number of patients treated in order to decide which providers use resources efficiently; and 5) political implications - politicians and the public have become less trusting concerning health services and data is needed to ensure their activities are more transparent. The feeling is growing that the public should have more protection, and that providers need to be more accountable. In addition, quality indicators can be used as a benchmark for making decisions (Øvertveit, 2001; Skews et al. 2000).

Furthermore, Mainz (2004) strongly emphasized that monitoring health care quality is impossible without the use of quality indicators. This is because the use of quality indicators is fundamental in bringing about accountability, quality improvement, prioritizing, and transparency in the health care system.

In the Thai context, Sriratanabul et al. (2000) have suggested that many health care providers agree that the main advantage of indicators is that they facilitate the development of learning organizations and quality improvement, rather than helping to make accreditation decisions.

Types of quality indicators

Quality indicators have been categorized into many types each based on different frameworks. If based on the characteristics of the variables used by the indicators, quality indicators can be divided into two types: simple and composite. Simple indicators result from the measurement or the estimation of an indicative variable. Composite indicators are obtained by the aggregation of several variables or simple indicators (Girardin, Bockstaller, van der Werf, & H.M.G, 1999).

Regarding users' framework is the base, quality indicators can be separated into those for internal and external use. Internal indicators are used by providers to monitor and improve the outcomes of care. Professionals and managers can use the data to investigate where potential problems lie, and how they may be solved. On the other hand, external indicators are used by the government, patient organizations or funding bodies to assess the quality of care and to compare the performances of health care providers (Freeman, 2002; Solberg, Gordon, & McDonald, 1997).

Events may be used as a basis. In this case the quality indicators are divided into two types; sentinel event and rate based indicators. A sentinel event is used to measure a serious, undesirable, and often avoidable process outcome. It may make available a performance measure which, by identifying an individual event, it would always lead to further analysis and investigation. Sentinel events usually occur infrequently and are always viewed as undesirable by the organization. A rate based

indicator is used to measure patient care events in which a certain rate of occurrence is acceptable. These may also feature aggregate data in which the value of each measurement is expressed as a proportion or a ratio (Idvall et al. 1997).

According to JCAHO (1993), a subgroup of quality indicators may be made up of sentinel event indicators and aggregate data indicators. Aggregate data indicators are divided into continuous variable indicators and discrete variable or rate based indicators. A continuous variable indicator is shown as the value of each measurement, which can fall anywhere along a continuous scale. A discrete or rate based variable indicator can be presented in the form of a proportion, and as a proportion or ratio between a numerator and a denominator.

The numerator is the number of patients for whom a specified event occurs. In turn, the denominator is the number of patients with the condition or procedure the indicator is measuring (JCAHO, 1993). The Quality Indicator Study Group (1995) has given more details about the characteristics of quality indicators, numerators and denominators. The numerator is the event being tracked, such as patient falls or wound infections, and the denominator is the patient population at risk of experiencing the event indicated in the numerator. The most common indicators in quality improvement are rate based indicators expressed as a proportion. The proportion or the ratio is expressed as follows:

$$\frac{\text{Number of patients for whom a specified event occurs}}{\text{Number of patients with the condition or procedure the indicator is measuring}}$$

In addition, using Donabedian's quality concept, both rate based and sentinel event indicators can be addressed using the aspects of structure, process, or outcome (Idvall et al. 1997).

The characteristics of good quality indicators

Quality indicators that provide meaningful information must possess the following key characteristics: reliability, validity, measurability, specificity, relevance, acceptability, and sensitivity to change (Campbell et al. 2002; Katz & Green, 1992).

Firstly, indicators must be reliable. Reliability refers to the accuracy of the indicators over time between different raters and across different patients. When using them, administrators should feel confident in their capacity to measure the variable that they want to measure. Secondly, indicators need to be valid and accurate. A valid tool measures what it is designed to measure; for example, a valid quality indicator identifies a situation in which quality may be lacking. Thirdly, an indicator needs to be measurable because it is used to evaluate and this can lead to improved quality. Fourthly, an indicator must be specific and definite. An indicator must relate to the particular issue or event. Fifthly, indicators should be acceptable to both those being assessed and those undertaking the assessment. Sixthly, an indicator should be sensitive to change and should have the capacity to detect change in the quality of care. Finally, indicators must be relevant to the patients; they should reflect the vital aspects of the service and touch on every subsystem of the care process.

In the nursing discipline, Jennings et al. (2001) identified the five expectations of the ANA quality indicator as follows: 1) a quality indicator should provide a standardized definition for quality of nursing care that could ultimately facilitate

comparisons across multiple sites; 2) a quality indicator should be easy to retrieve and realistic, thereby using existing data sources, personnel resources, and making minimal time demands; 3) a quality indicator should be relevant, credible, and acceptable to clinicians and administrators; 4) a quality indicator should be measurable and include specific details regarding measurement; and 5) a quality indicator should have demonstrable links to nursing care.

Types of events and level of care measured by quality indicators

Generally, the three types of events measured by quality indicators are as follows. 1) Clinical indicators, which relate to key aspects of patient care. These measure key factors concerning the care that patients receive, or outcomes of care, such as pain release after receiving medication. 2) Professional indicators, which relate to aspects of professional practice. They measure key factors in professional practice that impact on the quality of results, such as the ethical behavior of nurses. 3) Administrative indicators, which relate to organizational factors. These are critical tools for focusing on the desired outcomes and the essential processes for achieving these outcomes (Katz & Green, 1992). Indicators also identify areas of practice that lead to quality improvement (Skews et al. 2000). These may also be variables that supply information on other variables that are difficult to assess.

In addition, quality indicators can be categorized in terms of levels of care and components of care. For example, indicators of level of care can focus on the hospital, department, team, and group. For example, at the hospital level, an infection rate indicator can point to the quality of the infectious control exercised by the hospital. In a clinician care program, the number of recoveries can be quantified. Moreover, indicators can be adapted for different components of care such as patient complaints,

medication errors, waiting times, and unscheduled readmission rates (Øvertveit, 2001).

In general, nursing quality indicators have been developed using the quality assessment model of Donabedian as a base (1966; 1980). The nursing outcome indicators which are commonly used in practice are the physiological status, the psychological functions, behavior, knowledge, symptom control, patient satisfaction and well being, home maintenance, goal attainment, safety, and resolution of nursing diagnosis (Marek, 1989).

In maintaining or improving the quality of care, quality indicators may be selected from existing ones or may be developed for a specific event. However both methods need careful consideration. Quality indicators may be developed for a specific setting, for a specific group of patients, for a relevant problem or may be devised to suit all clients (Idvall et al. 1997).

Important aspects of care and threshold parameter of quality indicators

Important aspects of care or important aspects of care which should be identified before developing indicators are: aspects of care which occur frequently or affect a large number of patients (high volume); aspects of care that involve risk (high risk); aspects of care that tend to produce problems for patient and staff (high problem areas); and aspects of care that generate high costs (Potter, 1991).

Important aspects of care are those activities that are key functions of the care or service whether they are clinical, professional, and administrative activities. Important aspects of care affect the successful outcome of the care and add to the value of the service and the care (Katz & Green, 1992).

According to Katz and Green (1992), important aspects of care include the clinical, the professional, and the administrative aspects which may differ between two nursing departments that have different patient populations or provide different services. In addition, important aspects of care may vary from the patient's health status or patients' situation, or problem. By determining the important aspects of care, the provider or the researcher must focus on patients. It is critical that nurses understand to whom they are providing care because the important aspects of care are determined by the patient's problem. Idvall & Rooke (1998) stated that it could be valuable for nurses to identify what they consider to be important aspects of their care in specific areas because important aspects of care could then be the basis of developing quality indicators and it can focus directly on specific care.

The threshold parameter of a quality indicator is a level or point at which the results of data collection in monitoring and evaluation trigger intensive evaluation of a particularly important aspect of care. This can be used to determine whether an actual problem or opportunity for improvement exists (JCAHO, 1993).

While, Katz & Green (1992) stated that, a threshold is the edge between compliance and noncompliance with written standard. Compliance is a positive factor; the health care institutions deliver patient care in accordance with the structure, process, and outcome, and evaluation standard set by the institution. Compliance is composed of controllable factors that impact on quality outcomes such as nurses' competence, and patients' understanding of treatment. On the other hand, noncompliance is a negative factor; it is a lack of adherence or conformance to written standards. Non-compliance occurs when staffs do not deliver care based on the

structure, process, and outcomes or do not follow the standards set by the organization.

Threshold parameters can be set for both rate based events and sentinel events. Threshold parameters for sentinel events are absolute; the threshold for compliance is 100%, the threshold for noncompliance is 0%, and is no tolerance for error. In contrast, the threshold for compliance in rate based events is less than 100%, and the threshold for noncompliance exceeds 0%. Determining thresholds requires much information about the range of possible performances, and meaningful thresholds are essential for making reports in quality improvement programs. There are many systematic and non-systematic methods to identify the threshold parameter of each quality indicator, such as using evidence based support, when utilizing a Delphi survey (Rantz, Petroski et al. 2000).

Nursing quality and quality indicators used in Thailand

In Thailand, quality in the health care system has been an issue for a long time, but it became particularly critical after the economic crisis of the ‘nineties. At that time Thai health care was reformed and the Hospital Accreditation (HA) project was implemented. Subsequently the quality of care has been considered more broadly. There is increasing recognition that there are many stakeholders involved in quality care, including government staff, non-government organizations (NGOs), the private sector, the insurance companies, and clients. Suppachutikul (1998) defined quality in health care as having zero defects, no risk, no complications, doing well the first time, showing response to customers’ needs and expectations, and maintaining professional standards.

Within the Thai context, a definition of nursing care has been provided by Kunaviktikul et al. (2001). This is stated to be the way nurses respond to the physical, psychosocial, emotional, social, and spiritual needs of patients and doing this in a caring manner, so that the patients are cured, healthy, able to live normal lives, and all to the satisfaction of both patients and nurses.

A review of research showed that a number of Thai studies on the quality of nursing care were undertaken over a long period, but most of them have focused on the general issues related to the quality of nursing care. The number of research studies dealing with the quality of care increased after the hospital quality improvement and accreditation policy was introduced in the year 1999. The Nursing Division under the Medical Department, Ministry of Public Health, proposes to standardize nursing care in accord with different settings, such as out-patient and in-patient departments. This set of standardized guidelines included examples of indicators of nursing quality. However, there were few research studies undertaken directly related to quality care and the use of quality indicators of nursing care in relation to specific diseases (The Nursing Division under the Medical Department, 1999).

The earliest study that endeavored to address the quality of nursing care in Thailand was that of Kunaviktikul et al. (2000). They used a descriptive design to define nursing care and to identify quality indicators for nursing care in Thailand. This study consisted of two phases. In the first phase, various stakeholders concerned with quality of care from four levels of Thai hospitals were interviewed. The second phase consisted of meetings and consultations with selected quality experts to discuss the data collected from the first phase. The results showed that ‘the quality of nursing

care is a nurse's response to the physical, psychological, emotional, social, and spiritual needs of patients provided in a caring manner so that the patients are cured, healthy, and able to live normal lives; and both patients and nurses are satisfied. The structure indicators are management, facilities, resources, qualifications of professional nurses, and staff development. The process indicators are nursing practice and professional characteristics. The outcome indicators are incidents and complications, client satisfaction. In term of client satisfaction, it comprises satisfaction with information, time, satisfaction with pain management, and satisfaction with symptom management (Kunavikikul et al. 2001).

Tapaneeyakorn (2002) verified the perception of nurse administrators relating to the quality indicators of nursing care. This study was based on Donabedian's framework: structure, process, and outcome. The data were collected by mail survey and face-to-face interviews with nurse administrators. The questionnaire contained 50 quality indicators based on the American Nurse Association list of quality indicators for acute care. The quality indicators that were rated most important by nurse administrators were medication error rates, total nosocomial infection rates, nosocomial surgical wound infection rates, accurate and timely execution of therapeutic intervention and procedure, and adverse incident rates. The quality indicators rated as most frequently collected were all outcome indicators such as mortality rates, patient/family satisfaction, length of stay, total nosocomial infection rates, and patient education.

In the year 2004, Nursing Division under the Medical Department of the Ministry of Public Health proposed ten quality indicators of nursing care at the national level. These were developed through the consensus of experts and based on

the outcome model of Holezmer (1994). The ten indicators were: case mix; total nursing care hours per length of stay; nurses' satisfaction; ulcer pressure rate; nosocomial infection rate; effectiveness of infectious control; urinary tract infection from retained catheter; unplanned admission within 28 days; in-out patient satisfaction; and length of stay (The Nursing Division under Medical Department, Ministry of Public Health, 2004).

Additionally, in the year 2005, Kunaviktikul et al. identified and tested nine quality indicators sensitive to assess the quality of nursing care. The results showed that those were valid, reliable and shown to be usable in acute care settings in the northern part of Thailand

To conclude, the concept of quality of nursing care and the care indicators in Thailand was explored for a period of time in term of general care, most of them were not mentioned to the specific disease or other health problems.

Quality care and quality indicators of stroke care

Quality of stroke care has long been considered worldwide at both the national and the hospital level. Using a qualitative method, Radhika (1995) studied the experience of the quality of nursing care among adults recovering from stroke during hospitalization. The result provided a structural definition of the quality of nursing care. The themes of caring, promptness, and satisfaction could be found in nursing care for stroke patients in clinical settings.

According to Jones and Stewart (2002), nurses are the main contributors towards stroke care. They reported that nurses have actual and potential opportunities

that influence stroke outcomes for elderly patients in six situations, from before hospital admission to after being discharged. At the stage of hospital admission, nurses provide airway and aspiration protection, fluid and nutrition management, vital sign regulation, glucose monitoring, early mobilization, adherence to guidelines, early rehabilitation, and education. In the rehabilitation phase, nursing care for stroke patients should cover discharge planning, referral planning, and secondary prevention.

In the national health care system, many organizations have attempted to propose tools to audit stroke care. For example, the National Quality Stroke Care in England, Wales, and Northern Ireland proposed the Stroke Audit Tool to audit stroke care (Rudd et al. 2005). This tool is made up of two domains: service organization and clinical care. The service organization domain consists of organization of care, interdisciplinary services, continuing education, the multidisciplinary record, the agreed assessment record, team meetings, available of information to inform practice, communication with patients and caregivers, and service evaluation. Clinical care consists of acute care management, assessment, rehabilitation intervention, transfer to community, secondary prevention, and long-term care.

Susanne, Anneke, and Jack (2000) explored the results of liaison nursing for stroke patients in the Netherlands. They used the quality of discharge process questionnaire developed and validated by Kersten et al. (1989) and later adapted by Peters (1995 cited in Susanne et al. 2000). Five themes were identified to assess the overall quality of the discharge process: preparation of patients for the time of discharge and after care; patient information about the provision of aftercare by the home care organization; home care organization's information about patient's after

care; explanation to patient about what to use at home and how to use it; and arrival time of home care workers; medication; and supplies (Susanne et al. 2000).

There are many models dealing with the outcomes of stroke care (Kelly-Hayes, 2004; Walsh et al. 2002; Yamamoto & Magalong, 2003). The latest outcome model was suggested by Kelly-Hayes (2004). This model describes the framework used to measure the outcome of stroke care in five stages from the acute stage through to the recovery stage. The first stage is the clinical evaluation during acute care: these are identification of etiology, pathology, severity of stroke, assessment of comorbidity, and documentation of clinical causes. The second stage is the screening for rehabilitation which is the identification of the benefits of rehabilitation to the patient, and identification of problems needing treatment. The third stage is the assessment on admission to rehabilitation, and consists of the validation of the referral decision, development of the management plan, and provision of baselines for monitoring progress. The fourth stage is the assessment during rehabilitation which involves monitoring progress, adjusting the treatment regimen, and providing the basis for discharge decision assessment during rehabilitation. The fifth stage is the assessment in the community and is made up of the evaluation of adaptation to the home environment, determination of continued service, and assessment of caregivers' burdens.

Marini (1999) studied nurse caring behavior through the perceptions of institutionalized older adults. The results showed that the most important indicator of nurses' caring behavior is nurses' technical competency in catering for older adults' physical needs. The second most important is providing treatment that increased individuality and demonstrated respect.

Pound & Ebrahim (2000) reported that the three aspects of the nursing care process found in elderly stroke units and medical stroke units are the rehabilitation process, the relationship between nurses and therapists, and the ways in which multidisciplinary teams functioned.

Most studies about the quality of stroke care usually refer to the outcomes of care rather than other aspects. The quality indicators most widely used in stroke research are length of stay and infection rates (Allen et al. 2003). According to Kwan & Sandercock (2005), stroke outcomes can be placed in two groups: primary outcomes and secondary outcomes. Primary outcomes include the proportion of dead patients and dependent patients after treatment, while secondary outcomes consist of complications during hospital stay: pneumonia, urinary tract infection, deep vein thrombosis, pressure sores, use of investigation and medication, patient and family satisfaction, length of stay, cost of hospitalization and quality of life.

To conclude, the majority of the studies about quality of stroke care usually refer to the outcomes of care rather than other aspects.

Methodologies used for developing indicators

In this section, the theoretical underpinning of quality indicator development is described. Consequently, the methodologies used for developing indicators are also considered.

The theoretical underpinning of quality indicator development

Since it is accepted that quality is measurable (Crosby, 1979), various generic and specific quality tools have been developed to measure it. This ensures that the methodology of the development of a quality indicator represents the traditional scientific view; that is the measurement focuses on specific phenomena, data is presented in a numerical form, the observable facts can be repeatedly measured, and these are reproducible (Campbell et al. 2002; O' Brien et al. 2003; Roberston. MacKinnon, 2002; Rubin, Pronovost, & Diette, 2001). The phenomena or observable facts of the quality of nursing care which were observed and presented by the stakeholders would be the basis of this study. For these reasons, the investigator suggests that the philosophical underpinnings of the methodology used for the development of quality indicators is based on empiricism.

Empiricism, a perspective and view associated with the social sciences, holds that all knowledge has its origins in sensory experience and is derived through the senses, such as through visual observation. More loosely, it has been used to describe research that contains little in the way of reflection or theory, preferring to report `facts' as they appear to be (Introduction to the Philosophy of Social Research, 2005).

Empiricism is generally regarded as being at the heart of modern scientific method. Its basic idea is that our theories should be based on our observations of the world rather than on intuition or faith; thus empirical research follows *a posteriori* inductive reasoning rather than purely deductive logic. In addition, empirical methods are the means by which scientists gather information about the world in order to develop theories. These include experimentation and disclosure for peer review, two

of the ways whereby theories are assessed by scientists (Introduction to the Philosophy of Social Research, 2005).

To conclude, the philosophical underpinning of the methodology used for the development of quality indicators is based on empiricism perspective.

Methodologies used for developing indicators

The development of quality indicators may use either a top-down approach or a bottom-up approach. A bottom-up approach means that the quality indicators are identified, monitored and evaluated at the local level, whereas a top-down approach means that the quality indicators are developed by key persons at the top of organizations or outside the organization (Redfern & Norman,1990). Generally, the three phases of indicator development are: the phase of developing draft indicators the phase of empirical testing, and the phase of pilot testing.

1) The phase of indicator development.

This phase begins with the identification of important quality aspects. The initial set of draft quality indicators is then presented. There are several methods that can be used to identify the important aspects of care. Idvall & Rooke (1998) used focus groups to identify important aspects of nursing care for pain management for patients after surgery. Similarly, Rantz et al (1999) used in-depth interviews to identify important aspects of nursing home care, and Redfern & Norman (1999) applied the critical incident technique to identify important aspects of good and poor nursing care in general units.

2) The phase of empirical testing

There are two common methods that are widely used. They are the non-systematic and systematic methods. The end result of this process is the production of a set of quality indicators and sub-indicators.

In the non-systematic method the quality indicators are developed based on data availability, policy agendas and real life critical incidents or risk factors (Bauer et al. 2002; Campbell et al. 2002)

The systematic method features several methods that are widely used in quality indicator development, such as the evidence based method, the evidence combined with consensus method, and the guideline driven method (Bauer et al. 2002; Campbell et al. 2002). This approach has important features.

1) The systematic method is based on evidence. For this method, quality indicators are developed based directly upon scientific evidence in line with strictly conducted empirical studies. The better the evidence, the stronger the benefits gained when applying the indicators in terms of reduced morbidity and mortality or improved quality of care (Campbell et al. 2002). For instance, Pronovost et al (2003), selected quality indicators for use in intensive care units (ICUs) by reviewing and identifying indicators from an administration database in an ICU.

2) The systematic method based on guidelines generates guideline-driven indicators. Indicators can be based on clinical guidelines, which meet a set of standards, using structured questions and feedback to test face and content validity for data provided by many practitioners.

3) The systematic method based on evidence combined with consensus, is used when the scientific evidence base is limited, especially in the

generalist and holistic environment of general practice. This necessitates using external sources of evidence to develop quality indicators, including utilizing expert opinion (Worrall et al. 2002). Many consensus techniques are commonly used in this method, such as the Delphi survey, the RAND appropriateness method, and the nominal group technique. For instance, Spenser et al (2003) developed quality indicators for prostate cancer care by using an evidence base combined with a Delphi survey. Skews et al (2000) developed and validated clinical indicators for mental health nursing practice by using the RAND appropriateness method.

Furthermore, other methods that have been used in quality indicator development are the evidence review approach, the theory-driven approach, and the scale development method. For example, Pronovost et al (2003) developed quality indicators in Intensive Care Units by using the evidence review approach. Rantz et al (2000) developed quality indicators by identifying existing minimum data sets. Kitson (1986) developed nursing quality indicators for the care of the elderly by using the theory-driven approach. Idvall (2001) developed strategic clinical indicators in pain management, O'Brien et al (2003) developed quality indicators for Psychiatric Nursing in primary care, and Shield et al (2003) developed quality indicators for primary mental health services by using the scale development method.

In Thailand, several studies related to quality indicator development in the nursing profession have used various methods. For instance, Wibulchai (2001) developed composite indicators for higher education by using the scale development method. Srisatitnarakun (2002) developed composite indicators for the quality of educational management for the master of nursing science curriculum by using the Ethnographic Delphi Future Research method. Sirivibulyakit (2002) developed

performance indicators for nursing colleges under the Ministry of Public Health by using a Participatory Action Research method.

To conclude, the methods used for the development of quality indicators can be divided into two groups: the non-systematic group and systematic group. Each group is composed of several methods (see Figure 1)

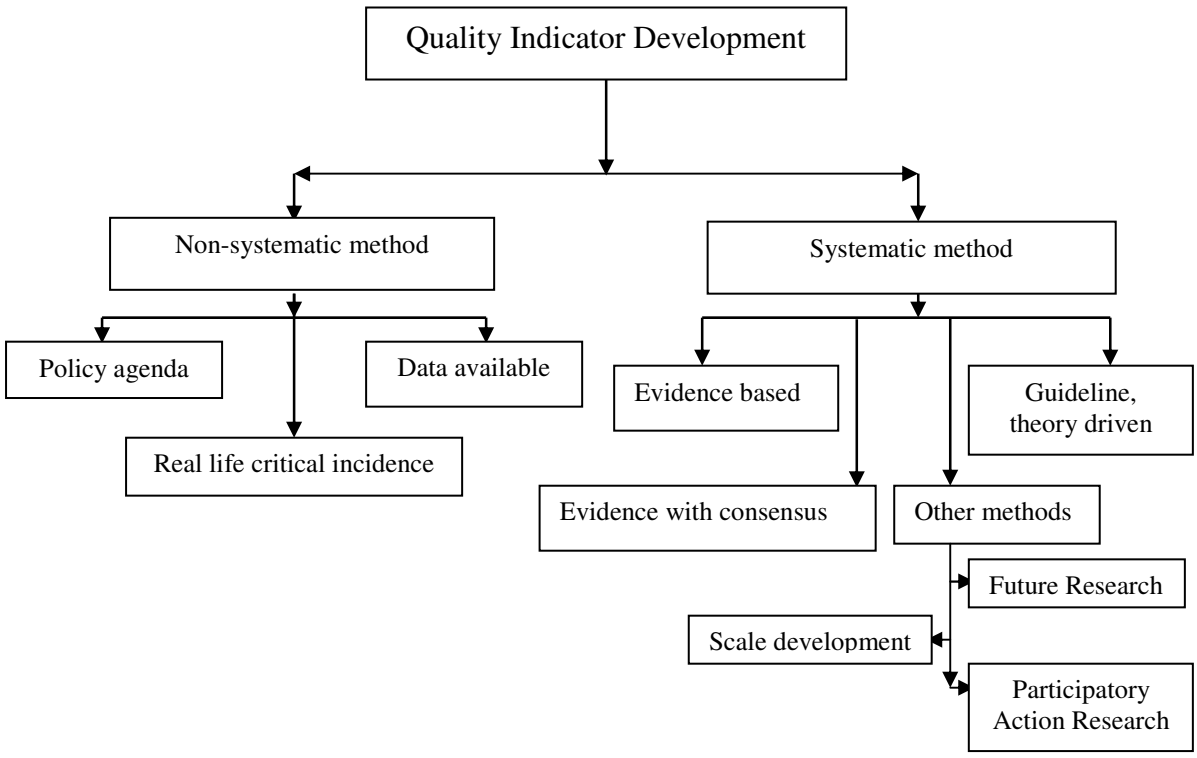

Figure 1 The method of quality indicator development

In this study, the indicators for nursing quality were developed for the care of non-surgical elderly stroke patients by using the systematic method based on evidence combined with consensus. The consensus method that was applied in this study was

the Delphi technique. Thus, the theoretical view of the Delphi technique will be considered below.

The theoretical view of the Delphi technique

The Delphi technique is a structured interactive method involving repetitive administrations of an anonymous questionnaire, usually across two or three rounds**.**

The Delphi technique is a research approach that aims at consensus through a series of rounds of questionnaire surveys (Hanafin, 2004). Numerous quality indicator development research studies have used the two or three rounds of Delphi technique in processing development indicators (Roberston & MacKinnon, 2002), whereas some researchers have used a modified Delphi approach (Lindsay, Schull, Bronskill, & Anderson, 2002). There are many factors which influence the rating of the process of developing quality indicators based on the systematic method using expert consensus. These include the composition of expert panels, the experts' characteristics, the experts' perspectives, the experience of expert panelists, and the rating processes used (Campbell et al. 2000).

According to Robson (1993), the epistemological basis for Delphi technique is the positivist paradigm, because the Delphi researcher maintains an objective position and is an uninvolved observer. The inclusion of experts assumes an ontological position of single reality, and a reductionism approach to the identification of the phenomenon under study could also be understood as adhering to the positivistic principle (Monti & Tingen, 1999).

The three types of Delphi technique are the Classical Delphi, the Policy Delphi, and the Decision Delphi. This study will use the Classical Delphi. The

Classical Delphi is characterized by five aspects: anonymity, iteration, controlled feedback, statistical group response, and stability in responses among those with expertise on a specific issue (vanZolingen & Klaassen, 2003).

The Delphi technique is appropriate for use in the development of quality indicators because of its advantages as a research method. It aims at identifying consensus and agreement, and it has the capacity to guide group opinion towards a final decision without group pressure being exerted. Scherer et al (1982), and Ferrell & Scherer (1983 cited in McKenna, 1994), successfully used the Delphi technique. It enabled respondents to state opinions on the components of good quality of nursing care, and it made possible the generating of standards for care by using experts' judgments. However, the Delphi technique has some limitations, such as difficulty in identifying a significant number of experts, poor response rates, time limitation, and the scientific method used (McKenna, 1994). It is necessary for a researcher to compensate for these limitations. For instance, McKenna (1994) advised that it was more beneficial to use face-to-face interviews in the first round because this increased the response rate.

The Delphi technique is, therefore, an iterative multi-stage process designed to combine individual opinions into a group consensus (Hasson, Keeney, & McKenna, 2000). Generally, the Delphi technique is made up of six steps: identifying problems; developing questionnaire statements for rating; selecting appropriate panelists; conducting anonymous iterative postal questionnaire rounds or surveys; feeding back results (qualitative and quantitative) between rounds; and summarizing and feeding back the results (Campbell et al. 2002; Gagliardi et al. 2005).

After identifying the preliminary problems, the Delphi questionnaire is drawn up. The initial Delphi questionnaire comes mostly from qualitative data. Qualitative data can be collected through focus groups or interviews and used to form a first round Delphi quantitative questionnaire. The first round questionnaire may include open ended questions that allow the experts freedom of expression and to offer ideas related to the problem (Keeney, Hasson, & McKenna, 2001). The results from the first round are used as a guide in drawing up the second round Delphi questionnaire. This process continues until consensus is obtained, but the return rates in each round decrease. The number of rounds used is governed by the amount of time available; however experience suggests that using two or three rounds is most appropriate (Beech, 1997; Hasson et al. 2000).

In the process of selecting appropriate panelists, the two issues that require most attention are the expertise of panelists and the number of panelists. The researcher should select participants who are experts and are interested in the research topic. The method of selecting panelists could be the probability sampling technique, and either purposive sampling or criterion sampling could be used (Hasson et al. 2000). The number of panelists sampled influences the results of the study, so adequate representation must be ensured. Ludwig (1997) advised that at least 15 participants should be involved. After the panelists are selected, they should be informed about the exact time of the surveys and given other details. The experts are asked about the importance and feasibility of the indicators being assessed.

It was necessary to assess the degree of importance of the nursing quality indicators in providing nursing care to non-surgical elderly stroke patients.

Feasibility indicates the degree to which the evaluators are able to collect the data. Generally, feasibility testing is applied to the set of indicators that are available and not too complicated for gathering the information required. Feasibility testing, when used for the development of indicators, can be separated into two types: feasibility of measurement and feasibility of implementation (Saliba & Schnelle, 2002).

In the data analysis stage the level of consensus or percentage of agreement is usually analyzed. There are different ideas about what is an acceptable percentage of agreement; some suggest 51%, and others require 70 % (Moore, 1979; Sumsion, 1998 cited in Hasson et al. 2000). Data from the first round may often be qualitative and can be analyzed by using content analysis techniques. Data from round two, which is usually quantitative, can be analyzed by producing statistical summaries for each item. Central tendencies (means, medians, and modes) and levels of dispersion (standard deviation and the inter-quartile range) can be computed to provide participants and researchers with information about the collective experience shown in the data (Hasson et al. 2000). The end result of this step is the drawing up of a new set of nursing quality indicators. In some studies, after the quality indicators had been tested, the matter of threshold parameters was also addressed.

3) The phase of pilot testing. This phase aims at testing the scientific strength of the newly developed indicators. The essential components of quality care indicators are reliability and validity (Campbell et al. 2002; Pronovost, & Diette, 2001; Scinto, Gaulusha, Krumholz, & Meehan, 2001). In addition, it is essential to establish the applicability of the newly devised quality indicator.

The reliability of a quality indicator can be thought of as its reproducibility which is critical when applying quality indicators among groups and within groups over time (Campbell et al. 2002).

Validity should be ensured through planning and the procedures used in an instrument's construction. The validity of a quality indicator is the extent to which the indicator accurately evaluates the aspects of quality being assessed. Validity can be tested by the face validity method. (Rubin et al. 2001).

Face validity is reflected when the new quality indicators are supported by consensus of the experts. Shield et al. (2003) developed quality indicators for primary care mental health services by using three rounds in a Delphi survey. During the first round the Delphi panelists were asked to rate the indicators on a nine point scale for their face validity.

Validity is shown when the indicator is supported by evidence that the indicators signify exactly the concept being assessed. The content validity of an indicator is generated using a consensus technique. Validity in the evaluation of quality indicators refers to how indicators are rated by panels (Campbell et al. 2002). Spencer, Stienberg, Malin, Adams, & Litwin (2003) developed quality of care indicators for early stage prostate cancer by using the RAND consensus method. In this study, they used a nine point scale to assess clinical validity from medical records.

Applicability is the degree to which quality indicators are realistic and applicable, given the resources available (Al-Assaf, 2001). In addition, Campbell et al (2002) emphasized that research methods that employ quality indicators should be sensitive to change and have predictive validity. Feasibility, with regards to the

aspects of care being assessed by a quality indicator, is related to there being enough patients to make it feasible to compare the data. Sensitivity to change is reflected when the indicator responds to changes in the quality of care, and is capable of detecting such change. As a result the indicator discriminates between and within subjects. Predictive validity is reflected when the quality indicator has the capacity to predict quality of care outcomes.

Summary

In summary, there are many important aspects of nursing care for hospitalized non-surgical elderly stroke patients. These require more attention from nurses, both in the technical and the interpersonal aspects. A well developed and comprehensive quality indicator will provide information that will indicate the effectiveness of nursing care. In turn, this could lead to improvement in the quality of nursing care for this group**.**