

CHAPTER 2

LITERATURE REVIEW AND THEORETICAL FRAMEWORK

Literature reviews and related researches

For the purposes of this study, literature on self-care practices of school-age children with NS was reviewed. Specifically, literature reviews included the following topics.

1. Nephrotic syndrome in children.
2. Concept of self-care.
3. Orem's self-care theory.
4. School-age children.
5. Self-care practices of school-age children with nephrotic syndrome.

Nephrotic syndrome in children

Nephrotic syndrome (NS) is defined by massive proteinuria, hypoalbuminemia, edema, and hyperlipidemia (Jacobson, et al., 1995; Wang, 1996). It is categorized into

Three types : congenital, primary, and secondary (Ball & Bindler, 1995). Congenital NS is an autosomal recessive disorder, and it is extremely rare. Primary NS is unassociated with systematic diseases. Secondary NS occurs as part of a systemic disease or is related to drugs or toxins. Specific treatment and condition are different among these types. In this study, subjects were school-age children with primary NS. Primary NS accounts for 90% of childhood nephrotic syndrome cases (Tang, 1990; Nash, 1992). Patients with primary NS may be divided into steroid-responsive and steroid-nonresponsive groups.

The following section of literature on NS in children included clinical manifestation, complications and relapse, medical treatment, and nursing care of primary NS.

Clinical manifestations of childhood primary nephrotic syndrome

As previously mentioned, primary NS is manifested by proteinuria, hypoalbuminemia, edema, and hyperlipidemia. Proteinuria is generally accepted as the primary abnormality in NS. The proteinuria is described as "heavy" to distinguish it from lesser degrees of proteinuria not associated with NS. "Heavy proteinuria" in pediatric patients generally implies a rate of excretion equal to or greater than 40mg/hour/m² body surface area per day (Nash, et al., 1992) or 0.05~0.1g/kg/day

(Tang, 1990). Proteinuria is as a result from increased glomerular permeability to plasma protein (Whaley & Wong, 1994).

For hypoalbuminemia, it means that albumin is less than 30g/L for toddler and older, 25g/L for infant (Wang, 1996). It is unbalanced state between input from hepatic synthesis of albumin and output from metabolic degradation, renal and gastrointestinal excretion of albumin. In a steady state, the rate of albumin synthesis, degradation, and loss are equal. In children with NS, because urinary excretion of protein increases, and hepatic synthesis of protein is in a steady state. Hypoalbuminemia as a result from excretion and degradation of protein are more than synthesis of protein. There is an inverse relationship between the rate of urinary excretion of protein and the degree of hypoalbuminemia (Nash, et al., 1992).

Hyperlipidemia means lipid more than 220mg/dl for toddler and older (Tang, 1990; Wang, 1996), 200mg/dl for infant (Wang, 1996). As with hypoalbuminemia, hyperlipidemia could be due either to increased synthesis or to decreased degradation of lipoprotein (Nash, et al., 1992). In general, there is an inverse correlation between the concentration of serum albumin and that of cholesterol (Newmark, 1975; Appel, 1985; cited in Nash, et al., 1992).

The mechanism of edema is not completely understood. The traditional view is that massive albuminuria in NS causes a decrease in intravascular oncotic pressure that allows extravasation of fluid and results in hypovolemia, increased antidiuretic hormone and aldosterone secretion, and renal salt and water retention (Jacobson, et al., 1995).

Edema is usually first noted as periorbital edema. Minimal edema may be recognized by parents or the children themselves before a physician seeing the patient. During this period, the periorbital edema often is triggered by a cold or to allergy. Sooner or later, the edema becomes generalized (Nash, et al., 1992). Generalized edema develops on the child's extremities, abdomen, or genitals (Ball & Bindler, 1995). Edema in children in the course of NS is usually described as soft and pitting edema (Nash, et al., 1992).

Complications and relapse of childhood nephrotic syndrome

Common complications of NS include infection of respiratory tract, skin, urinary tract, and peritonitis; abnormal growth; and thrombotic tendency (Tang, 1990; Nash, et al., 1992). Increased susceptibility to infection is common in children with NS in relapse. Explanations for the increased susceptibility to infection include low immunoglobulin levels, generalized protein deficiency,

defective opsonization of bacteria, splenic hypofunction and immunosuppressive therapy (Nash, et al., 1992). The common sites of infection including respiratory tract, skin, urinary tract, and sometimes abdomen (Tang, 1990).

Abnormal growth occurs in children with uncontrolled nephrotic syndrome. The major cause is corticosteroid therapy. Emotional deprivation and chronic anxiety also may play a role (Chantler & Holliday, 1973, cited in Nash, et al., 1992). In addition, protein-caloric malnutrition secondary to poor appetite, protein loss in the urine, and malabsorption due to edema of the gastrointestinal tract can contribute to abnormal growth (Tang, 1990).

Thrombotic tendency due to low blood volume, infection, high coagulation, and corticosteroid therapy may occur in some cases (Tang, 1990). The sites of thrombosis are often arterial involving the pulmonary artery, femoral, and cerebral arteries (Nash, et al., 1992).

Most children with NS respond to the special treatment, but many of these cases can recur easily, either steroid-responsive or steroid-nonresponsive groups. The relapse is triggered by a cold or to allergy. In China, 80% of children with primary NS will recur within 2 years, and 25% of these children with primary NS will recur more frequent; two relapses within 6 months and three relapses within one year (Tang, 1990).

Chinese children with NS who have frequent recurrences will receive corticosteroid therapy and alkylating agents, and have frequent hospitalizations. Children are admitted to hospitals for at least a month in average each time until edema and infection have been controlled (The First Affiliated Hospital of SUMS Medical Records, & The Second Affiliated Hospital of SUMS Medical Records, 1995-1997).

Medical treatment of childhood primary nephrotic syndrome

In China, medical treatment of childhood primary NS includes specific treatment and general treatment. The special treatment includes corticosteroid treatment as prednisone. Standard and long course of corticosteroid therapy is used in the seven hospitals in Guangzhou. Standard therapy is 4 weeks of daily oral prednisone 1.5-2 mg/kg/day divided into 3-4 times, and 4 weeks of alternate-day therapy one time per day, and then reduce 5-10 mg/day for two weeks, the total course is about 6 months. The long course is about 9 months for the cases of low steroid-sensitive. In the cases of frequent relapses, steroid dependence and nonresponse nephrotic syndrome, an alkylating agent as cyclophosphamide is used. The dose is 2-3mg /kg/day, the course is 8-12 weeks.

The general treatment of children with NS includes control of edema, treatment of infection (Nash, et al., 1992). Control of edema includes sodium restriction, diuretics, and receiving albumin intravenously (Tang, 1990). Using an antibiotic such as penicillin for treatment of infection.

Chinese traditional medicine, including tripterygium wilfordii hook, chai-ling-tang (Sairei-to) are also commonly used in children with NS.

Jiang (1994) conducted one study to observe the use of the Chinese herb tripterygium wilfordii hook for the treatment of nephrotic syndrome in children. Tripterygium wilfordii hook was administered orally at a dose of 1mg/kg body weight per day to 13 children with idiopathic nephrotic syndrome. Eight of the 13 children had changed from acute illness to remission which was maintained in 4 to 3 years after withdrawal of treatment. No serious side effects were noted.

Another study conducted by Liu (1995) examined therapeutic effects of chai-ling-tang (sairei-to) on the steroid-dependent nephrotic syndrome in children. Thirty-seven children with steroid-dependent nephrotic syndrome (SDNS) were administered with chai-Ling-tang (sairei-to) under corticosteroid. After treatment with chai-Ling-Tang, relapse was markedly improved, time for negative conversion

of proteinuria shortened, prednisone dosage significantly reduced, and side effects reduced.

In summary, NS is characterized by proteinuria, hypoalbuminemia, edema, and hyperlipidemia. Common complications include infection, abnormal growth and malnutrition. The treatment includes general treatment and specific treatment.

Concept of self-care

Self-care is the predominant form of medical and health care. Many disciplines include medicine, nursing, psychology, health education, sociology, public health, business administration and insurance concern with self-care. However, a focus and definition of self-care of each discipline are typically different (Steiger & Mcbroom, 1985). Concerning with the purpose of this study and the characteristics of subjects, only the concept of self-care in medicine and nursing is discussed.

In medical discipline, the focus of self-care is to transfer responsibility for certain levels of care (i.e., assessment, monitoring, treatment, compliance) to patients. Medical self-care is concerned with consumer performance of activities traditionally performed by physicians. Medical self-care encourages communication of relevant observations

to physicians to improve diagnostic and therapeutic decision making. Self-care goals include the appropriate practices of self-assessment and self-treatment skills, a decrease in inappropriate visits, and an increase in active participation and therefore increased compliance (Gantz, 1990).

Four representative definitions of self-care proposed by physicians indicate the diversity with the medical care profession. Levin (1976), considered by many to be a father of self-care, defined self-care as a process whereby a lay person functions on his/her own behalf in health promotion and prevention and in disease detection and treatment at the level of the primary health resource in the health care system. Ferguson (1980) defined self-care is practiced for the purpose of increasing compliance with medical regimens and encouraging people to take a more active role in their health care. In another medical view, Kemper (1980) defined medical self-care as how to recognize common problems, what to do when they occur, when and where to seek appropriate help. In addition, Verkery (1986) defined medical self-care as all those actions taken by an individual with respect to a medical problem and certain activities which are initiated by the individual.

In nursing discipline, nursing care is to identify and assess self-care needs and abilities, to design nursing interventions that address the needs, to evaluate the

effectiveness of these interventions with clients, and to understand how patient needs determine nursing actions. The goals of self-care in a nursing context are mutually derived among all members of the health care team, including clients and their families and support networks. Self-care goals focus on improving health status, coping, and functioning (Gantz, 1990).

Several nursing authors contributed to the concept of self-care in the context of nursing. All of them operates on the assumption that all individuals have a need to care for themselves. Norris (1979) identified self-care as the process that permits people and families to take initiation and responsibility and to function effectively in developing their potential for health. Hill and Smith (1985) proposed self-care as activities of daily living meet daily needs such as eating, dressing, ambulating, communicating; self-care involves making active choices about health care, not passively participating in activities. Self-care became a central concept of nursing with the publication of Orem's (1971, 1980, 1985, 1991, &1995). Orem has developed the concept to a great extent (Easton, 1993). Orem (1995) stated that self-care is the practice of activities that individuals perform on their own behalf in maintaining life, health and well-being. According to Orem (1995), when an individual engages in self-care, it is necessary to meet three types of

self-care requisite: universal, developmental and health deviation.

Comparing perspectives of the two disciplines, medical self-care focuses on encouraging communication to improve diagnostic and therapeutic decision making, while nursing emphasizes on people and families to take responsibility effectively in developing their potential for health. The scope of self-care in nursing is more extensive and complete. Especially, Orem's definition of self-care, the three types of self-care requisite cover all aspects of health promotion and illness prevention. Orem's view is appropriate in culture which individuals participate in their health care activities. In China, each person, healthy or sick is encouraged to be responsible for their own health and try to take part in self-care practices. Therefore, Orem's self-care theory is used as a framework of this study to identify self-care practices of Chinese school-age children with nephrotic syndrome.

Orem's self-care theory

Orem's self-care deficit theory of nursing composed of three constituent theories: the theory of self-care, the

theory of self-care deficit, and the theory of nursing system. The theory of self-care is described as it is used as the framework of this study. The central idea of the theory of self-care is that self-care are learned behaviors that purposely regulate human structural integrity, functioning, development and personal health and well being.

According to Orem (1995), self-care is deliberate action. Self-care practice is a response to self-care requisites or demands for self-care that an individual experiences. When an individual engages in self-care practices, it is necessary to meet three types of self-care requisites: universal, developmental, and health deviation.

Universal self-care requisites are common to all human beings during all stages of life cycle, adjusted to age, developmental state, and environmental and other factors. They are associated with life process, with the maintenance of the integrity of human structure and functioning, and with general well-being. The following eight self-care requisites are common to all human beings:

1. The maintenance of a sufficient intake of air.
2. The maintenance of a sufficient intake of water.
3. The maintenance of a sufficient intake of food.
4. The provision of care associated with elimination processes and excrements.

5. The maintenance of a balance between activity and rest.

6. The maintenance of a balance between solitude and social interaction.

7. The prevention of hazards to human life, human functioning, and human well-being.

8. The promotion of human functioning and development within social groups in accordance with human potential, known human limitations and the human desire to be normal.

Developmental self-care requisites are associated with human developmental processes and with conditions and events occurring during various stages of the life cycle and events that can adversely affect development. The commonly recognized life cycle stages with developmental events and occurrences are:

1. The intrauterine stages of life and the process of birth.

2. The neonatal stage of life when (a) born at term or prematurely and (b) born with normal birth weight or low birth weight.

3. Infancy.

4. The developmental stages of childhood, including adolescence and entry into adulthood.

5. The developmental stages of adulthood.

6. Pregnancy in either childhood or adulthood.

Initially these requisites were subsumed under the universal self-care requisites. Human progress toward higher levels of the organization of human structures and toward maturation during each stage of human development.

Health-deviation self-care requisites are associated with genetic and constitutional defects, human structural and functional deviations, with their effects, and with medical diagnostic and treatment measures. There are six categories of health-deviation self-care requisites:

1. Seeking and securing appropriate medical assistance in the event of exposure to specific physical or biologic agents or environmental conditions associated with human pathologic events and states, or when there is evidence of genetic, physiologic, or psychological conditions known to produce or be associated with human pathology.

2. Being aware of and attending to the effects and results of pathologic conditions and states, including effects on development.

3. prescribed diagnostic, therapeutic, and rehabilitative measures directed to preventing specific types of pathology, to the pathology itself, to the regulation of human integrated functioning, to the correction of deformities or abnormalities, or to compensation for disabilities.

4. Being aware of and attending to or regulating the

discomforting or deleterious effects of medical care measures performed or prescribed by the physician, including effects on development.

5. Modifying the self-concept (self-image) in accepting oneself as being in a particular state of health and in need of specific forms of health care.

6. Learning to live with the effects of pathologic conditions and states and the effects of medical diagnostic and treatment measures in a life-style that promotes continued personal development.

In summary, Orem's self-care theory provides holistic perspectives for assessing self-care practices of individuals. Therefore, Orem's self-care theory is properly used as a conceptual framework for identifying the levels of self-care practices of Chinese school-age children with NS based in this study.

School-age children

School-age children refer to boys and girls age between 6 and 12 years. Child development is a complex process, school-age is one stage of child development. This stage begins with entry into a school system and is characterized by growing intellectual skills, physical ability, and independence (Ball & Blinder, 1995). Many

theorists have attempted to organize their observations of behavior into a description of principles or a set of stages (Ball & Blinder, 1995).

Physical growth and development of the child during the school-age years is slow but steady (Neff & Spray, 1996). Their body proportions take on a slimmer look with longer legs, varying body proportion, and a lower center of gravity. Posture improves over that of the preschool period to facilitate locomotion and efficiency in using the arms and trunk. These proportions make climbing, bicycle riding, and other activities much easier (Whaley & Wong, 1994). With growth of muscle and maturation of neural system, school-age are able to perform physical activities such as eating, taking a bath, and brushing teeth (Havighurst, 1972). However, muscles are still functionally immature when compared with those of the adolescent and are more readily damaged by muscular injury caused by overuse (Whaley & Wong, 1994).

The psychosocial development of the school-age child involves two factors: development of a sense of industry and advancement of self-concept through successful achievements (Erikson, 1963). Psychosocial development during these years means learning how to cope with failure, learning endurance, and balancing feelings of inferiority with a sense of achievement (Neff & Spray, 1996). Positive self-concept

develops when children are curious about the environment, display appropriate levels of anxiety according to the task, and experience independent behaviors (Neff & Spray, 1996). According to Erikson (1963), school-age children are characterized by development of new interests and involvement in activities. The child takes pride in accomplishments in sports, school, home, and community. If the child cannot accomplish what is expected, however, the result will be a sense of inferiority. A sense of accomplishment also involves the ability to cooperate and to compete with others-to cope more effectively with people (Whaley & Wong, 1994). Peer relationships serve many socializing functions and greatly influence the development of self-concept (Neff & Spray, 1996).

Bandura(1977), a contemporary psychologist, believed that children learn through their social contacts with adults and other children. Children imitate the behavior they see, and if they are positively reinforce, this behavior tends to recur.

In Piaget's theory of cognitive development, school-age children acquire cognitive operations and apply new skills when thinking about objects, situation, and events (Piaget, 1969). Operational thinking is based on observation and evaluation of a situation. They are increasingly able to master symbols and to use their memory store of past

experiences in evaluating and interpreting the present. The gain insight into the basic components of concrete operational thought: conservation, classification, and combination skills. Conservation is the ability to determine whether an item has a greater, lesser, or equal amount, regardless of how it is arranged. Conservation also involves the concept that the properties of an object remain the same in spite of appearance changes. Classification is the ability to identify relationships among objects, people, and events. Combination is the ability to manipulate numbers and to learn the skills of addition, subtraction, multiplication, and division (Piaget, 1969). The school-age child also involves with two important cognitive tasks: establishment of logical or concrete thinking, enabling the child to deal with what is happening now rather than what could happen, and development of a moral code, enabling the child to deal with societal rules (Neff & Spray, 1996).

According to cognitive development of school-age children, they can be divided into three sub-age groups: 6 to 8 years are early school-age children, 8 to 10 years are middle school-age children, 10 to 12 years are late school-age children. In early school age children, they continue preoperational thinking until 7 years, and they just begin to understand cause and effect; concepts of past, present, and future; and they just begin to develop math and reading

skills. In 8.1-10.0 years, they are able to understand other's points of view, think more abstract and symbolic, read more proficient, and they can reverse operations and trace the order of events backward to beginning. In 10.1-12.0, they realize that a piece of clay, regardless of its shape, will occupy the same volume, they may be concerned with death issues, and they aware of mechanics of conception and birth (Neff & Spray, 1996).

Havighurst (1972) tasks of school-age children. For school-age children, he mentioned that they should learn physical skills, building whose some attitudes toward oneself as a growing organism, learn to get along with age-mates, develop fundamental skills in reading, writing, and calculating, develop concepts necessary for everyday living, develop conscience, morality and a scale of values, achieve personal independence, and develop attitudes towards social groups and institutions.

In summary, school-age children whose developmental stage is between those of early childhood and adolescence result in typical physical, cognitive, psychosocial, and social characteristics as previously mentioned.

Self-care practices of school-age children with nephrotic syndrome

Children strive for independence and most children can engage in at least level of self-care (Kearney & Fleischer, 1979). For school-age children, they should begin to learn good health practices at an early age and be able to actively and responsibly participate in their health care. With increased cognitive skills they become more self-reliant in making decisions and selecting from alternations. They are capable to making decisions about what health behavior they will pursue (Whaley & Wong, 1994). The following section consisted self-care practices of healthy school-age children, self-care practices of school-age children with chronic illness, and self-care practices of school-age children with nephrotic syndrome based on Orem's self-care theory.

Self-care practices of healthy school-age children

In this period, school-age children gradually become autonomous persons and competent in mastering new skills (Erikson, 1963). It is in school-age that children are preparing for ability and knowledge for becoming adults. Research on self-care practices of school-age children is limited. However, some related studies provided evidences that school-age children were able to engage in self-care

practices (Lasky & Eichelberger, 1985; Moore & Fairfax, 1987; Graham, & Uphold, 1992; Jiang, 1997).

Lasky and Eichelberger (1985) investigated the views and self-care behaviors of young children. The sample was 75 children (40 girls and 35 boys) from 3.5 to 12 years including school-age from separate families. Results showed that young children could indeed understand health promotion and how this relates to their own behaviors. They were frequently able to manage toileting independently. Also, they performed eating activities and handwashing activities through assisting by their parents.

A study conducted by Moore and Fairfax (1987) examined the relationship between autonomy and either self-care agency based on Orem's self-care theory or locus of control a sample in school-age children. The convenience sample consisted of 44 females and 48 males fifth grade students of two schools in the United States. Self-care Agency Assessment Questionnaire developed by Denyes (1990) was used to measure self-care agency. The results demonstrated that there was a positive relationship between autonomy and self-care agency. This research provided evidence that healthy school-age children demonstrated self-care agency.

Another study described and compared the health perceptions and behaviors of 83 school-age boys and girls. An

age-appropriate interview schedule was designed to collect data related to demographic characteristics, health perceptions, safety, life-style practices, nutrition, dental health, and care of minor injuries. Findings indicated that most boys and girls viewed themselves as healthy and managed their own care fairly well in the areas of seatbelt use, exercise, and dental health. Children were found to be knowledgeable in the management of simple injuries and how to respond in the event of an emergency. The results also indicated that 10% of the children skipped breakfast and over half ate snacks with empty calories (Graham, & Uphold, 1992). A descriptive correlational study using Orem's self theory as conceptual framework was conducted by Jiang (1997) to investigate self-care practices and influencing factors among Chinese school-age children. A multi-stage random sample of 263 school-age children was selected from primary schools in Xi'an City, Shaanxi Province, People Republic of China. School-Age Children Self-Care Practice Questionnaire developed by the author were used to collect data. The study results showed that the majority (92.4%) of Chinese school-age children had high level of self-care practices and parents' educational level was a predictor of self-care practices of these Chinese school-age children.

In summary, literature on school-age development and self-care practices of healthy school-age children provided

some evidences that school-age children can perform self-care practices. However, these related studies focused on exploration of self-care agency without description of self-care practices of healthy school-age children. Only the study of Jiang (1997) described the level of self-care practices of Chinese school-age children. The literature also indicated that Orem's self-care theory provided a theoretical basis for identifying the level of self-care practices of school-age children.

Self-care practices of school-age children with chronic illness

Children with chronic illness are at risk of interference with their physical, psychological, and social growth and development (Perrin, 1984). Lives of children with chronic illness are quite different from those of their peers who are well. The chronically ill children need to take medicine on a regular schedule; go to see physician as appointments; be hospitalized from time to time; and stick to special diets regimens (Aglaiia, 1985). Self-care practices of school-age children with chronic illness are different from that of healthy school-age children in these areas. No research described the self-care practices of school-age children with NS is available neither in China nor other countries. As nephrotic syndrome is one type of chronic

illnesses, literature on children with other types of chronic illness is reviewed as it can provide some information related to self-care practices of children with NS. The following literature review provides some evidences that school-age children with chronic illness have ability to engage in self-care practices.

Facteau (1980) explored self-care concept and the care of the hospitalized child and found that the children can engage in some aspects of self-care depending on their developmental level. The process that prepares a child for independence and increases his or her self-care agency starts at birth and develops through childhood. At each developmental stage, the child exhibits specific potentials and abilities for self-care agency increases. Conversely, as the child's self-care agency increases, the level of activity of the substitute self-care agent and the need for intervention such as parental assistance decrease.

In one research of self-concept and self-care activities of diabetes management in school-age diabetic children based on Orem's self-care theory, Saucier (1984) investigated 64 children between the ages of 10 and 12 years old. Self-care questionnaire developed by the investigator was used to determine the frequency of the diabetic child's

participation in the self-care practices. The result showed that these children participate in self-care activities of diabetes management most of the time. These activities included testing of urine and or blood, preparation and injections of insulin, rotation of injections of sites, monitoring of and responses to signs and symptoms of hypo-or hyperglycemia, basic hygiene for teeth and skin, and diet planing.

In summary, these studies indicate that school-age children with chronic illness can and do perform self-care practices at some extent. Some implications provided through literature review are that NS as one type of chronic illness, school-age children with NS can and do perform self-care practice.

Self-care practices of school-age children with nephrotic syndrome

Although nephrotic syndrome is one common chronic illness in children and self-care practices are important for school-age children with NS as previously described, no research describes the self-care practices of school-age children with NS is available. In this study, Orem's self-care theory was used as the framework to describe self-care

practices of school-age children with NS. Therefore, the following literature was reviewed to describe possible self-care practices of Chinese school-age children with NS based on Orem's self-care theory.

Universal self-care of school-age children with nephrotic syndrome

According to Orem (1995) universal self-care requisites include air, water, food, eliminative process and excrements, activity and rest, solitude and social interaction, prevention of hazards, and promotion of normalcy. Universal self-care dimension are associated with life processes, maintenance of human integrity, and general well-being.

1. Air, water, and food

In general, for school-age children with NS, they have sufficient intake of air. Daily maintenance fluid requirements is at least 1500 ml (Whaley & Wong, 1994). Like a healthy child, a regular diet is suitable for the NS child in remission. The child should eat all kinds of food such as rice or noodle, vegetable and fruit, meat (pork, chicken, and fish), egg, and milk. Water and food must be clean. Some children living in Guangzhou are influenced by the mass media

and they like to eat junk food. Some of school-age children may skip breakfast while going to school early in the morning or just eat some kinds of foods, which they like.

2. Eliminative process and excrements

The effective care associated with elimination processes and excrements should ensure effective control of the materials eliminated. In common, elimination of excrements should be one time a day both in a healthy and NS child and they should foster a good hygiene habit such as washing hand before eating, brushing teeth, and taking a bath.

3. Activity and rest

The maintenance of a balance between activity and rest controls voluntary energy expenditure and regulates environmental stimuli (Orem, 1995). Children are allowed to resume their usual activities with discretion in remission (Whelay & Wong, 1994). School-age children should spend 8 to 9.5 hours in bed and sleep approximately 95% on that time (Coble, 1987).

4. Solitude and social interaction

For school-age children, they are gradually becoming independent from others (Havighurst, 1972). At the same time, social interaction is also essential to obtain the material

resources essential to life, growth, and development (Orem, 1991). Daily relationships with age-mates provide the most important social interactions in the life of school-age children (Whaley & Wong, 1994). Especially for school-age children with NS who may experience separation from their friends due to their illness and frequent hospitalizations (Foster, et al., 1989).

5. Prevention of hazards and Promotion of normalcy

Prevention of hazards contributes to the maintenance of human integrity and to the effective promotion of human functioning and development (Orem, 1995). The promotion of normalcy prevents the development of conditions that constitute internal hazards to human life and the human functioning and development (Orem, 1995). School-age children should avoid contact with infected playmates, avoid being in crowded environment, and they should put on suitable clothes to prevent catching cold in winter.

Developmental self-care of school-age children with nephrotic syndrome

Developmental self-care requisites are associated with human developmental processes and events occurring during various stages of the life cycle and events that can

adversely affect development (Orem, 1995). For school-age children, they gradually increase a sense of personal and interpersonal competence by the acquisition of technologic and social skills (Whaley & Wong, 1994). According to Erikson (1963), a sense of industry is important for school-age children and failure to develop a sense of accomplishment results in a sense of inferiority. Also, they gain insight into the basic components of concrete operational thought: conservation, classification, and combinational skills (Piaget, 1969). School-age children with NS should be permitted to attend school and be encouraged to play with peers while overcoming a sense of inferiority (Whaley & Wong, 1994).

Health deviation self-care of school-age children with nephrotic syndrome

Health deviation self-care requisites include adjustment to illness, modification of the self-concept, securing medical treatment, accepting the negative treatment effects, performing therapeutic regime, and identifying pathology (Orem, 1995).

For children with NS, fluid restriction is limited to short-term use during massive edema. Strictly accurate

records of intake and output are essential for children with NS during the edema stage.

Diet therapy is important for children with NS. During periods of massive edema, salt is restricted in the form of no added salt at the table and excluding foods with very high salt content, but it should be adjusted to the child's appetite and must not interfere with nutrient intake (Whaley & Wong, 1994). It is advisable to avoid fried foods, sweetened drinks and snacks in-between meals to reduce steroid-induced obesity (Poskitt, 1988). High-protein diet in the management of NS was suggested in China in the past, but now it is not adopted because high-protein intake isn't useful for increasing in serum albumin. It is viewed that 1.5-2.0g/kg/day is suitable because it can maintain nitrogen balance and should provide high biologic value protein such as animal, fish, and egg (Yang, 1992).

For school-age children with NS, they are often placed on bed rest during the massive edema phase. As the edema subsides, child are allowed increased activity. They may require guidance in selection of play activities. Suitable recreational and diversional activities are also important parts of their care. (Whelay & Wong, 1994).

During the edema phase, they can keep edematous

areas such as scrotum, abdomen, and leg cleaned and separated with rough clothing, cotton or antiseptic powder. Even though children with NS are often placed on bed rest during the edema phase, they must be encouraged to turn regularly to prevent tissue breakdown (Whaley & Wong, 1994).

Specific treatment is important and has remarkable influence for children with NS. For school-age children with NS, it is better that they can take accurate dose and time of medicine on schedule as prescription, know symptoms and signs of side effects of drugs and tell their parents about these side effects, remind their parents to take to see doctors as appointments, and accept their body change such as obesity, cushing face and short stature.

Summary of literature review

Self-care is the predominant form of health care. Different disciplines describe self-care in different perspectives. In nursing discipline, Orem's self-care theory demonstrates its applicability in self-care of school-age children.

Some related studies described self-care practices of school-age children, including healthy children and children with chronic illness. However, most of available studies focused on exploration of self-care agency without description of self-care practices of school-age children.

Only one study described the level of self-care practices of Chinese school-age children. No research on self-care practices of school-age children with NS is available.

Conceptual framework

Orem's self-care theory is used as the framework of this study. According to Orem (1995), self-care practices of Chinese school-age children with NS were activities that the children perform on their own behalf in maintaining life, health, and well-being to meet three self-care requisites including universal, developmental, and health deviation.