THE EFFECT OF THE PROGRAM PROMOTING INFECTION PREVENTION BEHAVIORS IN FAMILY CAREGIVERS OF PRE-SCHOOL AGE CHILDREN WITH ACUTE LYMPHOBLASTIC LEUKEMIA: THE APPLICATION OF SELF-CARE DEFICIT NURSING THEORY

Maj. Su-ari Lamtrakul

A Dissertation Submitted in Partial Fulfillment of the Requirements
for the Degree of Doctor of Philosophy in Nursing Science
Field of Study of Nursing Science
FACULTY OF NURSING
Chulalongkorn University
Academic Year 2020

ผลของโปรแกรมส่งเสริมพฤติกรรมการป้องกันการติดเชื้อ สำหรับผู้ดูแลผู้ป่วยเด็กก่อนวัยเรียนโรคมะเร็งเม็ดเลือดขาวชนิดเฉียบพลัน: การประยุกต์ทฤษฎีพร่องความสามารถในการดูแลตนเองของโอเร็ม

พ.ต.หญิงสุอารี ล้ำตระกูล

วิทยานิพนธ์นี้เป็นส่วนหนึ่งของการศึกษาตามหลักสูตรปริญญาพยาบาลศาสตรดุษฎีบัณฑิต
สาขาวิชาพยาบาลศาสตร์ สาขาวิชาพยาบาลศาสตร์
คณะพยาบาลศาสตร์ จุฬาลงกรณ์มหาวิทยาลัย
ปีการศึกษา 2563

Thesis Title	THE EFFECT OF THE PROGRAM PROMOTING INFECTION PREVENTION BEHAVIORS IN FAMILY CAREGIVERS OF PRE-SCHOOL AGE CHILDREN WITH ACUTE LYMPHOBLASTIC LEUKEMIA: THE APPLICATION OF SELF-CARE DEFICIT NURSING THEORY
By	Maj. Su-ari Lamtrakul
Field of Study	Nursing Science
Thesis Advisor	Associate Professor WARAPORN CHAIYAWAT, D.N.S.
Thesis Co Advisor	Associate Professor JINTANA YUNIBHAND, Ph.D.

Accepted by the FACULTY OF NURSING, Chulalongkorn University in Partial Fulfillment of the Requirement for the Doctor of Philosophy

..... Dean of the FACULTY OF NURSING
(Associate Professor WARAPORN CHAIYAWAT, D.N.S.)

DISSERTATION COMMITTEE

..... Chairman
(Associate Professor Tassanee Prasopkittikun, Ph.D.)
..... Thesis Advisor
(Associate Professor WARAPORN CHAIYAWAT, D.N.S.)
..... Thesis Co-Advisor
(Associate Professor JINTANA YUNIBHAND, Ph.D.)
..... Examiner
(Associate Professor AREEWAN OUMTANEE, Ph.D.)
..... Examiner
(Assistant Professor SUNIDA PREECHAWONG, Ph.D.)
..... External Examiner
(Associate Professor Siripaarn Suwanmonkma, Ph.D.)

สุอารี ล้ำตระกูล : ผลของโปรแกรมส่งเสริมพฤติกรรมการป้องกันการติดเชื้อ สำหรับผู้ดูแลผู้ป่วยเด็กก่อนวัยเรียนโรคมะเร็งเม็ดเลือดขาวชนิดเฉียบพลัน: การประยุกต์ทฤษฎีพร่องความสามารถในการดูแลตนเองของโอเร็ม. (THE EFFECT OF THE PROGRAM PROMOTING INFECTION PREVENTION BEHAVIORS IN FAMILY CAREGIVERS OF PRE-SCHOOL AGE CHILDREN WITH ACUTE LYMPHOBLASTIC LEUKEMIA: THE APPLICATION OF SELF-CARE DEFICIT NURSING THEORY) อ.ที่ปรึกษาหลัก : รศ. ดร.วราภรณ์ ชัยวัฒน์, อ.ที่ปรึกษาร่วม : รศ. ดร.จินตนา ยูนิพันธุ์

การวิจัยกึ่งทดลองแบบมีการทดสอบก่อนและหลังครั้งนี้ มีวัตถุประสงค์เพื่อเปรียบเทียบพฤติกรรมป้องกันการติดเชื้อของผู้ดูแลผู้ป่วยเด็กก่อนวัยเรียนโรคมะเร็งเม็ดเลือดขาวชนิดเฉียบพลัน ซึ่งประกอบไปด้วย การบริหารยาที่เหมาะสม การควบคุมการติดเชื้อ และการเฝ้าระวังการติดเชื้อ ระหว่างกลุ่มทดลอง และกลุ่มควบคุม โปรแกรมการพยาบาลพัฒนาขึ้นโดยการประยุกต์ทฤษฎีพร่องความสามารถในการดูแลตนเองของโอเร็ม เพื่อสร้างให้ผู้ดูแลมีความสามารถในการปฏิบัติพฤติกรรมการป้องกันการติดเชื้อ ได้แก่ ความสามารถในการแสวงหาความรู้เกี่ยวกับพฤติกรรมการป้องกันการติดเชื้อ ความสามารถในการตัดสินใจเลือกปฏิบัติพฤติกรรมการป้องกันการติดเชื้อ และความสามารถในทักษะการปฏิบัติพฤติกรรมการป้องกันการติดเชื้อ กลุ่มตัวอย่าง คือ ผู้ดูแลผู้ป่วยเด็กก่อนวัยเรียนโรคมะเร็งเม็ดเลือดขาวชนิดเฉียบพลัน จำนวน 45 ราย แบ่งเป็นกลุ่มทดลองจำนวน 22 ราย และกลุ่มควบคุมจำนวน 23 ราย ผู้ดูแลฯได้รับการประเมินพฤติกรรมป้องกันการติดเชื้อ ในวันแรก และในวันที่ 12 ของการเข้าร่วมการวิจัย โดยใช้แบบสอบถามพฤติกรรมป้องกันการติดเชื้อ

ผลการศึกษาพบว่า กลุ่มทดลองมีค่าเฉลี่ยผลต่างของคะแนนพฤติกรรมป้องกันการติดเชื้อ สูงกว่าในกลุ่มควบคุม อย่างมีนัยสำคัญทางสถิติที่ระดับ 0.05 ผลการศึกษาครั้งนี้บ่งชี้ว่า โปรแกรมการพยาบาลโดยการประยุกต์ใช้ทฤษฎีพร่องความสามารถในการดูแลตนเองของโอเร็มนี้มีประสิทธิภาพในการส่งเสริมพฤติกรรมการป้องกันการติดเชื้อ ในผู้ดูแลผู้ป่วยเด็กก่อนวัยเรียนโรคมะเร็งเม็ดเลือดขาวชนิดเฉียบพลัน

สาขาวิชา พยาบาลศาสตร์ ลายมือชื่อนิสิต .....
ปีการศึกษา 2563 ลายมือชื่อ อ.ที่ปรึกษาหลัก .....
ลายมือชื่อ อ.ที่ปรึกษาร่วม .....

5777403036 : MAJOR NURSING SCIENCE

KEYWORD: PRESCHOOL, CHILDHOOD LEUKEMIA, SELF-CARE DEFICIT THEORY, FAMILY CAREGIVER

Su-ari Lamtrakul : THE EFFECT OF THE PROGRAM PROMOTING INFECTION PREVENTION BEHAVIORS IN FAMILY CAREGIVERS OF PRE-SCHOOL AGE CHILDREN WITH ACUTE LYMPHOBLASTIC LEUKEMIA: THE APPLICATION OF SELF-CARE DEFICIT NURSING THEORY. Advisor: Assoc. Prof. WARAPORN CHAIYAWAT, D.N.S. Co-advisor: Assoc. Prof. JINTANA YUNIBHAND, Ph.D.

This quasi-experimental, pretest-posttest design aimed to compare infection prevention behaviors (medication administration, infection control, and infection surveillance) between the family caregivers of preschool-age children with acute lymphoblastic leukemia (ALL) in the experimental group and the control group. This nursing program is based on the Self-Care Deficit theory, to enable dependent care agencies regarding infection prevention behaviors of family caregivers. The dependent care agency consisted of the ability to acquired knowledge, ability to make a decision, and ability to perform infection prevention behaviors. The sample was 45 family caregivers of preschool age children with ALL, 23 were an experimental group and 22 were a control group. The family caregivers have been evaluated for infection prevention behaviors on the first day and 12th day of study using the Infection Prevention Behaviors Questionnaires (IPBQ).

The finding revealed that the mean difference scores of infection prevention behaviors in the experimental group had significantly higher than those in the control group ($p < 0.05$).This result indicated the effectiveness of the Self-Care Deficit theory application's nursing intervention in enhancing infection prevention behaviors in family caregivers of preschool age with ALL.

Field of Study: Nursing Science
Academic Year: 2020

Student's Signature .....
Advisor's Signature .....
Co-advisor's Signature .....

ACKNOWLEDGEMENTS

From the bottom of my heart, I would like to send my gratefulness and respectfulness to the advisor, Associate Professor Dr.Waraporn Chaiyawat, and co-advisor, Associate Professor Dr.Jintana Yunibhand. For their sacrificed, support, encouragement, giving me valuable advice, and standing by me throughout my dissertation journey.

I deeply would like to express my gratitude to the experts who provide me with all suggestions for evaluating and revising the instruments. I am also profoundly grateful to my dissertation committees: Associate Professor Dr. Tassanee Prasopkittikoon, Assistant Professor Dr. Sunida Preechawong, Associate Professor Dr. Areewan Oumtanee and Associate Professor Dr. Siripaarn Suwanmonkha for their vital suggestions.

I am indebted to The Royal Thai Army for a part of grant support, including the T.A. scholarship from the graduate school Chulalongkorn University. Moreover, I can't having this without my doctoral classmates, they have offered me the most beautiful time in my studying life. My special thanks to, the faculty staff at the faculty of nursing that enables me to complete my doctoral study.

I am grateful to my research assistant, research participants and coordinators at all settings for dedicating their precious time to complete all intervention.

My heart give the arrow to Col. Chandhana Kamolsilpa, Assistant Professor. Col. Dr.Saisamorn Chaloeykitti and Col. Dr. Bussarin Arayathanitkul, my beloved commanders for believing in me and support all aspects of my study and also my colleague at Paediatric Nursing Department, RTANC for their support throughout the good and difficult time during my Ph.D.

Lastly, I received whole hearted encouragement and tremendous support from my mother, my sister, my aunts, and my lover who's my tears were put on their shoulders. Especially my lovely niece and nephew for unconditional love. Many thanks go to all other people whose names I have not mentioned enough for their generosity and enabling me to complete my dissertation.

Su-ari Lamtrakul

TABLE OF CONTENTS

LIST OF TABLES

PAGE

LIST OF FIGURES

PAGE

CHAPTER I

INTRODUCTION

Background and significance of the study

Potential factors associated with infection among children with acute lymphoblastic leukemia (ALL) undergoing chemotherapy courses are the most clinically relevant from an infection supportive care perspective. Those factors are (1) child characteristics at diagnosis, (2) treatment and course characteristics, and (3) risk behavior to infection. (Afzal et al., 2009; Bailey, Reilly, & Rheingold, 2009; Dockerty et al., 1999). For both factors, child characteristics at diagnosis and treatment and course characteristics often have decreased neutrophil counts and increased risk of infection. To the best of our knowledge, we are unable to manipulate factors related to disease and its treatment. In the role of nurse professionals, nurses could only provide patients with consistent treatment plans and care for the treatment's side effects. On the other hand, for those last factors, "risk behaviors to infection" can be manipulated by applying the nursing knowledge and nursing process. (Larson & Nirenberg, 2004; Lighter-Fisher, Stanley, Phillips, Pham, & Klejmont, 2016; Maia Rda & Wünsch Filho, 2013).

The risk to infection in preschool-age children with ALL undergoing chemotherapy can be controlled or reduced by family caregivers performing specific infection prevention behaviors.(Jansong & Chiyawat, 2016; Lighter-Fisher et al., 2016) Those behaviors are medication administration, infection control, and infection surveillance (American Cancer Society, 2013, and Thai pediatric oncology group,

2016). Infection prevention behaviors are vital for the survival of pre-school age children with acute lymphoblastic leukemia (Lighter-Fisher et al., 2016; Maia Rda & Wünsch Filho, 2013). Although, that impractical to completely eliminate the risk of infection, but the pediatric oncology professional recommended, the benefit of infection prevention in reducing the worst consequence and severity of infection in pediatric leukemic (National Cancer Institute, 2012, Schlesinger, Paul, GafterGvili, Rubinovitch & Leibovici, 2009). Accordingly, infection prevention behaviors are the crucial behavior in diminish the risk to infection among leukemic patients. Especially for a dependent person with potentially infection as preschool-age children with ALL.

Preschool age children (ages 3 to 6) with ALL in the most nursing concern in this phenomena according to the highest incident rate of age group and risk from their developmental stage. (Simpson, Smith, Ansell, & Roman, 2007; Tremolada, Taverna, Bonichini, Pillon, & Biffi, 2019; Willard et al., 2017).Preschool-age children develop gross motor strength they become more independent and begin to focus more on adults and children outside of the family. They demand to explore the things around them even more consequently, pre-school age children with ALL exposure to infection than other age. (Rosenbaum, Buck, & Brecher, 2000). Considering the preschool-age children are not achieving in self-care themselves in many daily routine activities, in agreement with their development and

maturity(Willard et al., 2017). Accordingly, the preschool-age children acquired an agent in performing self-care on behalf of themselves including prevent infection.

The word “agent” in legal terminology, is a person who has been legally empowered to act on behalf of another person or an entity. An agent may be employed to represent a client in negotiations and other dealings with third parties. The agent may be given decision-making authority. Underpinning the self-care deficit theory (SCDT), Orem presented a profound definition of “dependent- care agent” as “A maturing adolescent or adult who accepts and fulfills the responsibility to know and meet the therapeutic self-care demand of relevant others who are socially dependent on them to regulate the development or exercise of the person’s SCA” The responsible person may be responsible by virtue of legal or social standing.(OREM, 1989). From the definition, it was empirical evidence that Orem valued these people. In consideration of Thai family context, the significant care agent of preschool-age children are usually “family caregiver”.

Family caregivers are “relatives, friends, or neighbors who provide assistance related to an underlying physical or mental disability for at-home care delivery and assist in the activities of daily living (ADLs) who are unpaid and have no formal training to provide those services. (East, 2010). To this study, family caregivers are father or mother or relative of preschoolers (3-6 years old) with ALL undergoing chemotherapy. Who take care of a daily routine care as well as the various comforts

of the children throughout the time the child was hospitalized and home care at least 12 hours. Accordingly, family caregiver is significant other that comparable as an agent who responsible of provide care including prevent infection.

Family caregivers' infection prevention behaviors are vital for the survival of pre-school age children with ALL undergoing chemo therapy.(Jansong & Chiyawat, 2016; Lighter-Fisher et al., 2016; Maia Rda & Wünsch Filho, 2013). Nurses, responsible to sustain patients' health and family for successful completion of the course of chemotherapy and diminish its side effects, thus, nurse need to look for an effective approach to encourage family caregivers to perform these behaviors. Notwithstanding, the evidence demonstrated the existing nursing intervention regarding to promote family caregiver's infection prevention behaviors. (Boonchuay, Sanasuttipun, Chintanadilok, & Sanpakit, 2016; Ghanbari & Pouy, 2018; Saeui, Chintanadilo, Sriussadaporn, & Sanasuttipun, 2009; Siripoon & Tangvoraphonkchal, 2014; Tanner, Sencer, & Hooke, 2017). Contrarily, incident of inappropriate family caregivers' infection prevention behaviors are remained as the worldwide problem.(Queen Sirikit National Institute of Child Health, 2008., .El-sawy, Ismaril, Magy and El-sam-man, 2009., Shaker, Kareema and Mouroge, 2011., Pediatric department of Phramongkutklao hospital, 2016; Siripoon & Tangvoraphonkchai., 2014; Sonkongdang, Kantawang and Niyomkar, 2015).

There have been caregivers with poor practice regarding infection prevention behaviors, such as inappropriate preparing low bacterial diet (Shaker, Kareema and Mouroge, 2011), poor practice regarding oral hygiene care(de Mendonça et al., 2012; Paprom & Tangworaphonkchai, 2014). Some caregivers have been unrestricted hand washing before and after providing care to the patients, some of them took the patients to high-risk place to infection such as fresh market or crowded place, provide raw vegetable and fruit to the patient, allowed the patient to eat inappropriate food, allowed their child to have pets, unrestricted infection prevention regarding nutrition and unrestricted using protective equipment. (Pediatric department of Phramongkutklao hospital, 2016; Siripoon & Tangvoraphonkchai., 2014; Sonkongdang, Kantawang and Niyomkar, 2015).

Considering, the current nursing role of infection prevention in children with ALL undergoing chemotherapy, it need to be complement, the concentration on individually demand was required. Even supposing, the evidence revealed numerous impressive nursing intervention in promoting infection behaviors of family caregivers. (Boonchuay, Sanasuttipun, Chintanadilok, & Sanpakit, 2016; Ghanbari & Pouy, 2018; Saeui, Chintanadilo, Sriussadaporn, & Sanasuttipun, 2009; Siripoon & Tangvoraphonkchal, 2014; Tanner, Sencer, & Hooke, 2017). Nurse commonly provided sufficient infection prevention knowledge and enhanced family caregivers' infection prevention skill. Nevertheless, the goal of caring children with chronic

disease need to expand in home care setting, thus the family caregiver opportunity to confront with unexpected situation. (Moore & Beckwitt, 2006). For overcoming accidental situation, the care agent (family caregiver) called for adequate competency. The family caregiver required ability to seeking information other than the existing knowledge. Moreover, during unpredictable situation, the ability to judgment was demanded. Hence, the appropriate nursing intervention in promoting infection prevention behavior of family caregiver with preschool age children with ALL, should comprise of the exercise for develop their own agency regarding infection prevention behaviors.

Theory based nursing intervention attribute purposefully and systematically nursing practice (Fleury, Sidani, & Improvement, 2018).The Self Care Deficit Theory (SCDT) is one of conceptual models proposed to guide nursing practice. Self-care deficit theory was used in this study with the reason of concepts and relational statements are consistent with the variables and hypotheses. Orem's theory provides a comprehensive base to nursing practice. It is functional in the different fields of nursing. Orem (2001). The major strength of SCDT is considered a general theory with broad concepts and can be applied in many different situations, rehabilitation, emergency department, intensive care unit, medical-surgical, etc. where self-care requisites are the driving force for individuals and nurses. It is applicable to all of those who need nursing care and also applicable to all of situations in which

individuals (including children) cannot meet their entire self-care request (George, 2010, Biggs, 2008). Accordingly, SCDT was considered to be applied in the phenomenon.

The application of Self Care Deficit Theory (SCDT) was illuminated in all perspective of nursing area: research, practice, education, and the furtherance of theory development.(Aish & Isenberg, 1996; Banfield, 2011a; Biggs, 2008; Gaffney & Moore, 1996; Kumar & Classifications, 2007; Shah, Abdullah, & Khan, 2015; F. L. Wilson, L. M. Baker, C. K. Nordstrom, & C. J. I. i. c. p. n. Legwand, 2008). To this study, SCDT had been selected to apply regarding to, this theory concerns the health-related limitation of individual to engage in the continuing performance of care (Orem, 2001). Although, the application of Self Care Deficit Theory (SCDT) was illustrated in behavioral modification nursing research. On the other hand, without the acknowledgment strengths of theory-based intervention research, the explication of SCDT in intervention development and evaluation and, in particular, theoretical predicted mechanism of change have been limited. (Fleury, Sidani, & Improvement, 2018; Melnyk & Morrison-Beedy, 2019). Among existing study referenced a SCDT theoretical framework on which the intervention under evaluation was based, there was minimal explanation of the linkage between the concepts in the framework and the content of the intervention(Biggs, 2008).The researchers often derived concept without critical analysis or theoretical substruction to proper a specific nursing area.

(Aish & Isenberg, 1996; Biggs, 2008; Kumar & Classifications, 2007; F. L. Wilson, L. M. Baker, C. K. Nordstrom, & C. Legwand, 2008). The application of SCDT should be valuate by imply the theory to identify the factors causing the problem, determine linkage between variable and deduction the construct or concept to be implication level.

In agreement with the significance of infection prevention in preschool-age children with ALL undergoing chemotherapy and in response to this concern of the limitation of presently nursing intervention to promote infection prevention behavior. Moreover, the restriction of the application of Self Care Deficit Theory (SCDT), it needs to be derived to match a specific nursing area. This study is an attempt to improve nursing care for pre-school age children with ALL undergoing chemotherapy by applying the SCDT in promoting family caregivers' infection prevention behaviors. For the purpose of successful completion of the course of chemotherapy and diminish its side effects, thus improving the quality of life for pre-school age children with acute lymphoblastic leukemia.

Research question

Does the program promoting infection prevention behavior promote infection prevention behavior in family caregivers of preschool-age children with acute lymphoblastic leukemia?

Research objective

To compare infection prevention behaviors of family caregivers of pre-school age children with acute lymphoblastic leukemia between those receiving the program promoting infection behavior and those receiving conventional care.

Research hypotheses with Rationale

Orem (2001) recommended nursing strategy to help person to achieve in dependent- care in which the person's requirements for help. Family caregivers of preschool age children with ALL were required nursing agency for the reason of insufficient dependent care agency. Those agency are dependent care agency operation confined to ability to estimative operation, transitional operation and productive operation. Underpinning SCDT, power components are the key element to accomplish in dependent care agency. PPIB work on intervene all 4 significant power components by used the helping method derived from SCNT consist of guiding, teaching, coaching and providing the developmental environment. Consequently, the caregiver who receiving the program were developed infection prevention behavior by the following reasons:

- Having ability to acquire technical knowledge regarding infection prevention behavior refer to nursing activities of discussing and exchanging technical knowledge of appropriate information resources. Including, guidance the process of seeking useful resources for gathering trustworthiness information. Moreover, the

intervention will provide significance health information, empowerment and promote confidence in knowledge seeking skill.

- Having ability to make decisions about infection prevention refer to nursing activities to improved decisions making skills in complicated or unexpected situation regarding infection prevention behavior by providing sufficient knowledge through the teach-back technique and practicing decisions making skills by simulation teaching. Furthermore, providing the activities of discuss alternative situation, and guiding the way to overcoming or compensation for those limitations behavior.

- Having ability to perform infection prevention behavior, refer to nursing activities that provide personal coaching via the demonstration and return demonstration technique regarding crucial skills of infection prevention such as drug administration, hand washing, facial mask using, and children's oral hygiene care.

- Having motivation to perform infection prevention behavior, refer to nursing activities that encourage the participants to assess their own infection prevention behavior ability and limitation, encourage participants to establish the goals of behavior, and motivate themselves for behavior change or maintain appropriate behavior.

The study hypothesis to be explored in this study was "The family caregivers in the experimental group have higher difference scores (d) of infection prevention behaviors than the family caregivers in the control group."

Scope of study

The researcher indicated the scope of the study as follows:

1. Research design of this study was a quasi-experimental pretest-posttest control group design.

2. The population of this study was family caregivers of pre-school-age children with acute lymphoblastic leukemia who have been admitted for chemotherapy treatment at the pediatric inpatient unit at Pramongkutklao Hospital.

3. The independent variable was a program promoting infection prevention behaviors and the dependent variable was the infection prevention behavior of family caregivers.

Operational definition

Infection prevention behaviors: Refer to the acts of family caregivers perform to their child purposely to avoid the risk of infection. The behaviors consist of:

1. Medication administration's behavior is the act to solve the condition of neutropenia and other immunological deficiencies and also use the medication for prophylaxis and pre-emptive antimicrobials.

2. Infection control's behavior is the acts of caregiver aim to avoid opportunistic infection for their child. Including the element of strictly hand washing, use facial mask, keep patient, good personal hygiene, stickily aseptic technique,

stickily clean food, and drink avoid to closed contact with a sick person, avoid the crown area, avoid to use cups, eating utensils, or toothbrushes used by others.

3. Infection surveillance's behavior refers to the acts of caregiver to observe, evaluate, and provide appropriate care when their child present to sign and symptom of infection

Conventional nursing care: refer to routine nursing activity of providing health education regarding infection prevention behaviors to the caregivers. Consist of 1 bedside teaching at the first day of admission during hospital orientation and distribute caring manual when discharge planning was perform.

The program promoting infection prevention behavior in family caregivers: refer to nursing activity that operate improving infection prevention behaviors agency for family caregivers of pre-school age with ALL. Which based on Orem's Self-Care Deficit Theory (Orem, 2001). The program included 5 sessions of individual approach at IPD and 1 telephone visit after discharge. The method of guiding, teaching, coaching, and supporting-providing the developmental environment were applied in the program: the detail as follow

1.1 Session 1: (30 minutes)

Objective: To investigate caregiver ability and limitation in performing Infection prevention behavior and establish the goal of care according to infection prevention.

1.2 Session 2 divided in two part (30 minutes and 40 minutes).

Objective: To promote all of 3 dependent care operations by using the method of teaching, via teach-back technique for personal health education in topic of “Infection Prevention Behaviors in children with ALL”. Moreover, personal coaching will be provided by the strategy of demonstration and return demonstration the crucial skill of infection prevention: drug administration, hand washing, facial mask using, and children’s oral hygiene care.

1.3 Session 3: (30 minutes)

Objective: To promote all of 3 dependent care operations by teaching method. Simulation based teaching will be applied, the researcher provide VDO clip scenario “Which one what would you choose”. After watching clip scenario, the participant will be encourage to make decision in those situation. The researcher will convince the participants to discuss alternative situation, provide the reasons for those decision and how to overcoming or compensation for limitations

Session 4: (30 minutes)

Objective to promote all of 3 dependent care operations by provide content reviewing and establish infection prevention behavior planning. The researcher discussed the participant to supply and regulate essential environment by encourage the participant to evaluate the limitation that may arise when returning home and

plan the solution to manage housewares environment for promoting infection prevention behavior.

Session 5: (40 minutes)

Objective: The researcher review all content by discussing capability and limitation of the caregiver. Motivation and empowerment for those improvement behavior. Adjust or provide beneficial information for inappropriate behavior. Moreover, infection the prevention behavior plan will be evaluate. Caregivers will be assess ability to practice preventive behavior and provide additional suggestions for incomplete sections.

Telephone visit (3 days after discharge, 15 minutes) to support dependent care action after discharge, to supportive and motivation.

Expected benefit

1. The study contributes to the body of knowledge concerning on Orem's self-care deficit nursing theory. The finding will identify the effect of Family caregivers' infection prevention behavior promoting program on caregiver's infection prevention behaviors for pre-school age children with acute lymphoblastic leukemia between the control group and experimental group, including before and after receiving the program. This knowledge can offer important intervention for nurses, for promoting an appropriate infection prevention behaviors to a caregiver of preschool-age children with acute lymphoblastic leukemia

2. Health care providers, multidisciplinary teams, policymakers can provide suitable support and guidance to promote family caregiver's infection prevention behaviors for pre-school age children with acute lymphoblastic leukemia

3. Pediatric nurses will be able to use the finding of this study to develop research and nursing intervention to promote appropriate caregiver's infection prevention behaviors for pre-school age children with acute lymphoblastic leukemia

CHAPTER II

Literature review

In order to study the effect of the program promoting infection prevention behaviors in family caregivers of pre-school age children with acute lymphoblastic leukemia: the application of the Self-Care Deficit theory. This chapter provided an integrative research review of empirical finding with the state of the summarization that related to each concept of interest. The literature review included the following:

1. Pre-school age children with acute lymphoblastic leukemia
2. Infection in pre-school age children with acute lymphoblastic leukemia
3. Nursing care to prevent infection in preschool age children with acute lymphoblastic leukemia
4. The role of family caregiver to prevent infection in preschool age children with acute lymphoblastic leukemia
5. Infection prevention behaviors
6. The application of the Self-care deficit theory
7. The development of program promoting infection prevention behavior
8. Related research
9. Conceptual Framework

1. Pre-school age children with acute lymphoblastic leukemia

Cancer in children differs from cancers in adults (Leonard, 2002). One major of difference is origin. Leukemia is the most common cancers of children younger than 5 years; therefore, the critical issues related to these two forms of cancers are presented in the following paragraphs. These issues are, however, relevant to children undergoing treatment for other types of cancer as well. Most cancers present symptoms before the diagnosis is made. For leukemia, fatigue, fever, and leg pain may occur at the time that parents seek medical attention for the child. In the case of leukemia, blood counts establish the initial diagnosis, followed by bone marrow aspiration and a lumbar puncture. For brain and other solid tumors, the diagnostic procedures may include computed tomography (CT) scans and magnetic resonance imaging (MRI).

Acute lymphoblastic leukemia (ALL) accounted for over75% of childhood leukemia and the most common childhood cancer (Coebergh et al., 2006). It is a complex malignancy disease that affect hematopoietic cell of the bone marrow and is typified by the malignant proliferation of lymphoblast that affect the normal process of maturation and differentiation of cell in the bone marrow tissue with cancerous cell (Plasschert et al., 2004). ALL is the most common cancer in children. It accounts for 25-30 percent of all cancers in children. In Thailand, acute leukemia is found in 38.1% of all cancers in children. At present, Acute Lymphoblastic Leukemia (ALL) can be divided into two major groups: Acute Lymphoblastic Leukemia (ALL)

and Acute Myeloid Leukemia (AML). Statistic information among 2015-2020 proposes increasing number of children with ALL. (ruginanon, 2019). The number of patients who were diagnosed with ALL is 3463, 3803, 3970 and 3852 respectively. (National Cancer Institute, 2019) Children with ALL may suffer from symptoms due to the cancer itself and also suffer from the side effect from the malignancy treatment.

The highest incidence of ALL occurs in the first five years of life at approximately 5.7 per 100000 persons per annum (Plasschert et al., 2004). In the past, a diagnosis of ALL meant a certainly fatality. However, over a past five decades, survival rates for childhood leukemia have increased. World data on pattern of survival between 1988 and 1997 have estimated 5 year survival rates at 80% for children diagnosed between 1 and 4 years of age, 75% for children diagnosed between 5 and 9 years of age, 62% for children diagnosed between 10 and 14 years.(Coebergh et al., 2006).

ALL most often occurs in children ages 3 to 5 and affects slightly more boys than girls.(Hunger & Mullighan, 2015). Pre-school age children with acute lymphoblastic leukemia (ALL) peak is consistent in both developed and developing countries and its magnitude apparently correlates with the socioeconomic status.

Treatment of children with acute lymphoblastic leukemia

After a diagnosis is made, treatment is started as soon as possible with a goal of obtaining a remission or disease-free state (Ettinger, Bond, & Sievers, 2002). As a

consequence of medical and technological advancement the recuperation rate of leukemia is 60-70%. Methods of treatment include chemotherapy, radiation therapy, and bone marrow transplantation. Chemotherapy has been proven to be the most effective treatment method for pediatric patients. For leukemia, the initial phase of treatment is called induction, i.e., inducing a remission. Consolidation and maintenance phases follow, respectively. Consolidation treatment is designed to prevent the occurrence of central nervous system disease and takes 1 to 2 months. Maintenance treatment continues for 2 to 3 years (Westlake & Bertolone, 2002). Generally during this treatment, children are seen monthly for blood counts and chemotherapy. Maintenance chemotherapy is generally tolerated with fewer symptoms.

Antineoplastic agents kill rapidly dividing cells (Ettinger et al., 2002). Because young children have more body tissues with dividing cell populations because of their physical development, they are susceptible to acute and long-term adverse effects on cerebral and somatic growth and development (Ettinger et al., 2002). In general, a combination of chemotherapeutic agents is used to cause multiple kinds of damage to cells and to stop reproduction. There are several categories of chemotherapeutic agents available: alkylating agents, antimetabolic, plant alkaloids, antibiotics, nitrosourea compounds, enzymes, steroids, and immunotherapy. All chemotherapeutic agents have both side effects and toxic responses. Chemotherapy

agents cause cell death not only of cancer cells but also of other normal, rapidly dividing cells, particularly those in the gastrointestinal system, hair follicles, and blood cells (Docherty et al., 2006). The immediate effects of cell death in the gastrointestinal system are nausea, vomiting, mucositis, diarrhea, and constipation; in the hair follicles, it is alopecia; and in the bone marrow, the effects are anemia, neutropenia, and thrombocytopenia (Docherty et al., 2006).

Chemotherapy treatment in Thailand. As mentioned above, the Queen Sirikit National Institute of Child Health (QSNICH) uses the cancer treatment guidelines from the Children's Cancer Study Group (CSG) (Hematology Department of the Queen Sirikit National Institute of Child Health, 2008). However, there are some differences in treatment application in Thailand. For example, most children in the U.S. receive intravenous chemotherapy treatment as outpatients while Thai children are inpatients because of the distance from their homes. Most Thai children do not have their own or their parents' health insurance, but they can still access healthcare services and treatment without cost during hospitalization. In a public hospital, children receive the basic necessary treatments for cancer during hospitalization; they stay in a large room with other children with cancer. Furthermore, they receive intravenous chemotherapy through the peripheral intravenous method whereas children in the US receive it through a port or external catheter.

Side effect of acute lymphoblastic leukemia's treatment.

The main treatment for children with acute lymphocytic leukemia (ALL) is chemotherapy, which is usually divided into 3 phases: induction, consolidation (also called intensification) and maintenance. When leukemia is diagnosed, there are usually about 100 billion leukemia cells in the body. Killing 99.9% of these leukemia cells during the 1-month induction treatment is enough to achieve a remission, but it still leaves about 100 million leukemia cells in the body. These also must be destroyed. An intensive 1- to 2-month program of consolidation treatment and about 2 years of maintenance chemotherapy helps destroy the remaining cancer cells.

Chemotherapy drugs attack cells that are dividing quickly, which is why they work against cancer cells. But other cells in the body, such as those in the bone marrow (where new blood cells are made), the lining of the mouth and intestines, and the hair follicles, also divide quickly. These cells are also likely to be affected by chemo, which can lead to side effects. The side effects of chemo depend on the type and dose of drugs given and the length of time they are taken. Common side effects may include: increased risk of infections (due to low white blood cell counts), easy bruising or bleeding (due to low blood platelet counts), Fatigue (due to low red blood cell counts), Hair loss, Mucocitis, Loss of appetite, Nausea and vomiting, Diarrhea, Numbness, tingling, or weakness in hands or feet (from nerve damage) (Brackett, Schafer, Leung, et al, 2014).

Therefore Infection is a frequent complication experienced by many children with ALL, with potentially life-threatening consequences that may result in hospitalization, prolonged length of stay, increased mortality ,increased hospital fee, and high risk to complicated infection.(Cull &Nolan, 2009; Bailey, Reilly & Rheingold, ,2009). Not only is the complication during hospital time, but also infection is the first leading cause of re-admission before appropriate time. (Bailey, Reilly & Rheingold, 2009)

2. Infection in pre-school age children with acute lymphoblastic leukemia

Current knowledge for prevent infectious complication in ALL children was developed in many kinds of strategies. From existing literary propose the strategy to prevent infectious complication in ALL children as:

-Out patient service instead in-patient service due to avoid hospital environment

-Anti-biotic and colony stimulating factors

-Restrict hospital environment via using laminar air flow and High- Efficiency Particulate Air (HEPA)

-Protective Precaution: separation room, wear gown coat, keep patient good personal hygiene, stickily aseptic technique, and stickily clean food and drink. (Larson and Nirenberg, 2007, Bailey, Reilly & Rheingold,2009; Prasertsri, Namwongprom, & Pakdevong ,2012)

Even though many evidence provide the practice due to prevent infectious complication in ALL children, but incidence of infection still the first cause motility and cause of poor prognosis in ALL children as well.

Infection is a frequent complication experienced by many children undergoing chemotherapy treatment, with potentially life-threatening consequences that may result prolonged length of stay, increased mortality, increased hospital fee, high risk to complicated infection due to delayed or reduce the effectiveness of treatment(Bailey et al., 2009). Source of infection included unidentified (18.9%), sepsis (17.8%), gastroenteritis (15.6%), pneumonia (10.0%), and upper respiratory tract infection (10%). Only 56.3% of patients had pathogens identified, gram negative bacteria 42.2% (the most common pathogen was Pseudomonas aeruginosa, followed by Escherichia coli and Salmonella, grampositivebacteria26.7%, fungus17.8%, and virus13.3%. Bacteremia occurred in 28.3% and mortality was 29.4% (eighty percent from gram negative bacteremia).The most infection that cause of unplanned re-admission in pediatric patient with acute lymphoblastic leukemia in Phramongkutklao Hospital were as, ENT infection (56.5%), sepsis (24.8%), CNS infection (15.2%), and other infection (3.5%), respectively. (Statistic information from January-August 2016).

From the exiting evident showed twenty-three studies that evaluated the association between childhood infection and leukemia. Among those that analyzed infections in the first two years of life, five reported reduced risk of ALL associated

with infection in the skin, (Maia Rda & Wünsch Filho, 2013)ears, (Jourdan-Da Silva et al., 2004)or gastrointestinal tract, (McKinney, Juszczak, Findlay, Smith, & Thomson, 1999) and episodes of roseola and/or fever and rash. Other two studies detected a higher risk of ALL in children with more frequent episodes of upper respiratory tract infection, fungal infection and chickenpox. (Maia Rda & Wünsch Filho, 2013) A further five studies found reduced risk associated with some diseases and increased risk associated with others. (Jourdan-Da Silva et al., 2004; Perrillat et al., 2002; Rosenbaum et al., 2000; Schultz et al., 2007; Simpson et al., 2007) The association between common cold, fever, history of infection in the infant and leukemia was not significant in two studies.

Preschool age children with ALL will develop gross motor strength they become more independent and begin to focus more on adults and children outside of the family. They will want to explore about the things around them even more. So preschool age children with ALL take more risk to infection than younger age. Preschool children want to touch, taste, smell, hear, and test things for themselves. They are eager to learn. They learn by experiencing and by doing. Preschoolers learn from their play. They are busy developing skills, using language, and struggling to gain inner control. They risk to approach the causes of infection by direct contact to pathogen or indirect contact from utensil, child stuff, water or diet.

Factors associate with infection in preschool age children with acute lymphoblastic leukemia

Potentially factors associated with infection outcomes only among intensive chemotherapy courses as these are the most clinically relevant from an infection supportive care perspective. The following variables were evaluated:

(1) Child characteristics at diagnosis

The Pediatric Oncology Group (POG) and Children's Cancer Group (CCG) adopted a common set of risk criteria in 1993 at an international conference supported by the National Cancer Institute (NCI). The NCI criteria were based on factors that had international acceptance and reproducibility: age, initial white blood cell (WBC) count, and the presence of extra medullary disease at diagnosis. To further refine therapy, both POG and CCG have also used additional risk factors that have been shown to have an impact on patient outcomes (eg, ploidy, blast karyotype, and early morphologic response). Recently, the POG and CCG merged to form the Children's Oncology Group (COG). This merger provided an opportunity to reassess individual approaches and develop a consensus classification strategy for treatment assignment. A COG ALL risk classification subcommittee developed a classification system that was (1) optimal for patient care, (2) amenable to asking biologic and therapeutic questions, and (3) functional so that risk-directed therapy could be offered to all eligible patients regardless of geographic location. This

analysis included the clinical and biologic variables used in each legacy group, such as age, WBC count, sex, extra medullary disease, blast cytogenetics and ploidy, and early response to therapy. The resulting classification system incorporated the strongest prognostic indicators predictive of outcome in both groups, despite marked differences in treatment strategies, and delineated 4 risk groups with different outcomes. Therefore, the children with ALL

(2) Treatment and Course characteristics

Chemotherapy Induced Neutropenia (CIN) in hematological malignancies. Chemotherapy Induce Neutropenia (CIN) is defined as neutrophils production suppressed by cytotoxic drugs and subsequent number decrease and availability of neutrophils to fight infection (Nirenberg et al., 2006). Chemotherapy Induced Neutopenia (CIN) is a common and critical side effect of chemotherapy that drives patients to become susceptible to infection. It is associated with delay and reduction in dose of treatment, hospitalization, cost of treatment increase, altered HRQOL and death (Camp-Sorrell, 2011; Daniel & Crawford, 2006; Polovich et al., 2009).15 Neutropenia commonly occurs 7-14 days after chemotherapy administration (Nirenberg et al., 2006). Absolute Neutrophil Count (ANC) is a marker and riskclassification of infection. The grading of neutropenia are classified by the National Cancer Institute's Common Toxicity Criteria (NCI-CTC): grade 0 = normal ANC, grade 1= ANC < LLN-1,500 mm3, grade 2 =ANC <1,500-1,000/ mm3, grade 3= ANC <1000-

500/mm3, grade 4 =ANC < 500/mm (National Cancer Institute, 2010). If Absolute Neutrophil Count is lower than limit of normal (neutropenia), cancer patients will risk infection. The more absolute neutrophil counts decrease, the higher risk of infection.

(3) Risk behavior to infection

Pre-school age children with acute lymphoblastic leukemia (ALL) are high risk to infection, which results from their developmental age. Preschool age children with ALL develop gross motor strength they become more independent and begin to focus more on adults and children outside of the family. They want to explore about the things around them even more. So pre-school age children with ALL take more risk to infection than younger age. (Tremolada et al., 2019) They risk to approach the causes of infection by direct contact to pathogen or indirect contact from daily routine activities.

According to Self-care ability limited in preschool patients with leukemia; therefore caregivers are especially important for this age group. In the same position, caregivers able to take potential risk for infection in children by perform inappropriate infection prevention behavior.

For both factors, the characteristics at diagnosis and treatment and course characteristics often have decreased neutrophil counts and increased risk of infection. To the best of our knowledge, we unable to control factors related to disease and its treatment. In the role of nurse professional, nurses could only

providing patients with consistent treatment plans and caring for the treatment's side effect. On the other hand, for those last factor, "risk behavior to infection" can be manipulated by applying the nursing knowledge and nursing process. (Xiaomei, Kevin, Jeffrey and et al., 2009) *Therefore, infection prevention behavior is the crucial behaviors in reduce risk to infection among leukemic patients. Especially, for dependent person and high risk to infection as preschool age children with ALL*

3. Nursing care to prevent infection in preschool age children with acute lymphoblastic leukemia

The information related to the various interventions to enhance caregiver's behavior regarding infection prevention in children with acute lymphoblastic leukemia were studied. There has been found the additional interventions conducted to promote infection prevention behavior in caregivers of children with ALL as the following. The study of Sen-Ngam ,Pratepchaikul and Phuwathananon (2005), who used an educational program for improving maternal knowledge and practice in caring for children with leukemia. The study revealed that there was a significant difference between maternal knowledge in control and experimental groups ($p < 0.05$) but no significance difference ($p > 0.05$) in maternal practice. Similarly to, Promwisest and college (2013) conducted the caregiver's empowerment program to improve home care behavior of caregivers in preschool age children with leukemia, the result showed that program had not significantly improve behaviors of

caregiver. The researcher suggested that in the future research should be develop a modified similar program to achieve for sustainable behaviors.

Moreover, the study of Siripoon and Tangwiriyapong (2014) conducted the program of educative supportive based on Orem's self-care theory, on care behavior regarding beginning to end stage leukemic. For this study, one group pre-posted design was comprised, the result presented the mean score of caregivers' care behavior was significantly improved after intervention ($p<0.01$). However, this study did not provide sufficiency sample size (n=10). In the same line with, Jansong (2015) studied the effect of nursing intervention based on Pender's health promotion model on infection prevention behaviors in mothers of 1-5-year-old children with cancer undergoing chemotherapy. In this study there were significant improvements in infection prevention behaviors of the participant in experimental group ($P<0.05$). But, insufficiency sample size (N=16, 8 in the treatment group and 7 in the control group) had been propose in conclusion.

Presently, it has been found a small number of the additional interventions conducted within specific objective to promote infection prevention behavior in caregivers of children with ALL. However, the result of some previous studies presented ineffective of conventional intervention. (Balling and McCubbin, 2001; Sen-Ngam, Pratepchaikul and Phuwathananon, 2005; Promwisest and college, 2013; Pediatric department of Phramongkutklao hospital, 2016). Unfortunately, although

some studies provided statistic significantly in the result, but the authors could not represent strongly methodology to verify the effective of intervention. Some prior studies had inadequate sample size or used non parametric design. (Siripoon and Tangwiriyapong, 2014; Jansong, 2015). There has been lack of validity research to enhance infection prevention behavior of caregiver in preschool age children with ALL in Thailand.

Although the result of some former studies provide the effective of intervention. Contrary, prior researcher proposed the limitation of those nursing intervention as well. Most existing nursing intervention were developed as a standard nursing care. All participants were received the same intervention, not specific to individual need. According to Self-care deficit Nursing theory (Orem, 2001), individual need or requirement is significant factor influence to perception and learning. If the person have to receive too much information and out of their need, can be the barrier of ability to perform behaviors.

Moreover existing nursing intervention usually provide the program focusing on infection prevention behaviors in hospital. There are a few studies aim to extend those behavior to home care. According to ALL require significant long-term follow-up and care interchange between hospital and home. Therefore it is necessary for caregiver to achieve in good infection prevention behavior in home situation as well.

Considering, the current nursing role of infection prevention in children with ALL undergoing chemotherapy, it need to be complement, the concentration on individually demand was required. Even supposing, the evidence revealed numerous impressive nursing intervention in promoting infection behaviors of family caregivers. (Boonchuay, Sanasuttipun, Chintanadilok, & Sanpakit, 2016; Ghanbari & Pouy, 2018; Saeui, Chintanadilo, Sriussadaporn, & Sanasuttipun, 2009; Siripoon & Tangvoraphonkchal, 2014; Tanner, Sencer, & Hooke, 2017). Nurse commonly provided sufficient infection prevention knowledge and enhanced family caregivers' infection prevention skill. Nevertheless, the goal of caring children with chronic disease need to expand in home care setting, thus the family caregiver opportunity to confront with unexpected situation. (Moore & Beckwitt, 2006). For overcoming accidental situation, the care agent (family caregiver) called for adequate competency. The family caregiver required ability to seeking information other than the existing knowledge. Moreover, during unpredictable situation, the ability to judgment was demanded. Hence, the appropriate nursing intervention in promoting infection prevention behavior of family caregiver with preschool age children with ALL, should comprise of the exercise for develop their own agency regarding infection prevention behaviors.

4. The role of family caregiver to prevent infection in preschool age children with acute lymphoblastic leukemia

As care quickly shifts in today's fast-paced healthcare environment from hospital to home, there is an increasing demand on the families and home care agencies. Recognizing that care of the patient does not cease upon discharge, it is critical for home care nurses caring for pediatric cancer patient and educating family to have a knowledge base of the disease, treatment, and side effect, couple with a plan of care.(Bailey, Reilly & Rheingold, ,2009). The diagnosis of a life-threatening illness, the intensive treatment, the high frequency and long duration of hospital stays affect the whole family (Björk M., Wibe T., and Hallström I. 2008, Woodgate, Degner 2003, Patterson, Holm & Gurney 2004). The ALL children can result in traumatic effect on both families and the child. Pediatric care has adopted the philosophy of a family-centered care approach in order to maximize the well-being of pediatric patients. The philosophy is founded on the collaboration of the family, nurses and hospital staff to plan, provide, and evaluate care. The philosophy is grounded on several principles that revolve around the central idea that the family is the constant in a child's life (Neal et al., 2007). Nurses must work with the family to develop the best plan of care for a child. Parents are experts in their child's care and know more about their child then we can ever learn through assessments or charts.

The family is also the child's main source of support providing stability in what can be an otherwise traumatic period in a child's life. The presence of the

family during health related procedures can significantly reduce both the child's and parent's anxiety (Neff, 2003) Decreased anxiety from the patient and family decreases the stress on healthcare workers, positively affecting their ability to provide treatment. In essence the nurse must attend to both the needs of the family and child in order to maximize a child's outcomes. The capacity of family caregivers to take on the care of the children with cancer may have a significant influence on both health outcomes and cost in terms of readmission rates and the use of inpatient facilities. Children with leukemia suffer from many health problems and complications as a result of the disease process or the course of treatment. The more knowledge and skills caregiver's have, the more skillful they become in managing their children illness

Underpinning of the Orem's Self-care Deficit Nursing Theory, central to this theory is that people experience health-related limitations that render them incapable of providing self-care or dependent care. The pre-school age children remain need care giver in taking care themselves in many daily routine activities, especially when they turn to be the patient. Family caregivers are really significant function as dependent care agents who perform self-care on behalf of their children in maintaining life and health

According to the data from pediatric hematology department of pediatric unit, Pramongkutklao hospital in the project of promoting QOL in pediatric with acute

lymphoblastic leukemia propose some information from opened ended question related to family caregiver perform inappropriate behaviors to prevent infection at home such as unrestricted hand washing before and after providing care to the patient, took the patient to high risk place to infection such as fresh market or crowded place, provide raw vegetable and fruit to the patient, allowed patient to eat inappropriate food, allowed their child having pet, and unrestricted using protective equipment. From this information reflect inappropriate behaviors of family caregiver to prevent infection at home.

In the same position to the study of Wannita, Seepan and Srimana.(2015) about factors influencing family caregivers' behaviors regarding nutritional care for preventing infection in leukemic children with chemotherapy induced neutropenia. The finding showed most of the family caregivers reported their behaviors regarding nutritional care in leukemic children with chemotherapy induced neutropenia as follows: they always selected and provided high caloric and low bacterial diets, provided snacks between meals, and avoided providing contaminated food. In preparing food, the majority of the caregivers reported always washing their hands before contacting and providing food, and encouraged their child to wash hands before meals. But the finding present some inappropriate behaviors regarding nutritional care for preventing infection is majority of them reported always were not washing fruits and rinsing utensils with hot water.

And the result also relevant to the study of Shaker, Kareema and Mouroge (2011), assessment of home care management for caregiver's having leukemic adolescent patient in Erbil city. The result shows the majority of family caregivers have poor practice regarding some infection prevention behaviors such as preparing appropriate meals, the (93.75%) have poor practice regarding necessity of fluids, while (92.5%) of them had very poor practice regarding oral hygiene care.

Moreover, the finding from the study of El-sawy, Ismail, Magdy and El-sam-man about knowledge and home practices of family caregivers having children with leukemia attending national cancer institute Cairo University propose that regarding total knowledge and practice total scores of the family caregivers, more than two third of the family caregivers gained partially satisfactory knowledge and practice total scores while the minority gained satisfactory knowledge and practice scores regarding care of their children with leukemia at home. This result stand in position with Hasan, Hussein & Hashim, who revealed that, the majority of caregivers had deficient knowledge regarding causes, symptoms, complication and treatment of the leukemia and the majority of caregivers had poor practice regarding complications and side effects of chemotherapy.

On the same line, Gelesson et al., carried out a study at the chemotherapy outpatient clinic of the pediatric oncology institute in Brazil and indicated that, family caregivers of cancer patients had lack of knowledge & practice and needed

orientations about the disease, it is dangerous signs and side effects of chemotherapy and relevant actions. Also Saeui et al., reported that, family caregivers having lack of knowledge and competence in caring for acute leukemia in children undergoing chemotherapy. This could be related to caregiver's lower educational level, income and place of residence plus lack of awareness regarding leukemia and improper health education programs about their children condition from health care providers.

Caregiver perform inappropriate infection prevention behaviors are the cause of risk to infection (Schlesinger, Paul, Gafter-Gvili, Rubinovitch, & Leibovici, 2009). Follow by the worst consequence as poor prognosis of disease, at greatly increased risk for complicated infection and this cause of delayed or reduce the effectiveness of treatment. (Bailey, Reilly & Rheingold ,2009; Schlesinger, Paul, GafterGvili, Rubinovitch & Leibovici, 2009). Avoiding the worst consequence from infection the caregiver should have appropriate infection prevention behaviors. Therefore, the effective way to avoiding the worst consequence from infection is the family caregivers should have good infection prevention behaviors. (American Cancer Society, 2013 and Thai pediatric oncology group, 2016)

5. Infection prevention behaviors

Infection prevention behaviors is the acts of family caregiver perform to their child purposely to avoid risk of infection. (CDC, 2014; American Cancer Society, 2013) Several professional groups have recommended behaviors to reduce potential exposure to infections. However, many common nursing interventions to prevent

infection are based on tradition or expert opinion and have not been subjected to scientific examination. Infection prevention behaviors in pediatric cancer guideline were recommend by American Cancer Society (2013) and Thai pediatric oncology group (2016) are the acts of family caregivers perform to their child purposely to avoid risk of infection. The behaviors consist of:

(1) Medication administration aims to solve the condition of neutropenia and other immunological deficiencies and also use the medication for prophylaxis and pre-emptive antimicrobials

(2)Infection control are the acts of caregiver aim to avoid opportunistic infection for their child. Including the element of strictly hand washing, use facial mask, keep patient good personal hygiene, stickily aseptic technique, stickily clean food and drink, avoid to closed contact with sick person, avoid crown area, avoid to use cups, eating utensils, or toothbrushes used by others.

(3) Infection surveillance refer to the acts of caregiver to observe, evaluate, and provide appropriate care when their child present sign and symptom of infection

Dietary restrictions Smith and Besser (2000) conducted a survey of current practices in 156 institutions and found that the majority placed neutropenic patients on dietary restrictions. Somerville (1986) discussed the issue of special diets for neutropenic patients, but the review is outdated and did not present any original data. Moody, Charlson, and Finlay (2002) published a comprehensive review of

evidence from clinical trials regarding the effectiveness of such diets and concluded that the majority of these studies were confounded by other concurrent manipulations (e.g., a total protected environment). Despite the fact that many hospitals continue to use low microbial diets (French, LevyMilne, & Zibrik, 2001), no recent studies were found that linked dietary restrictions with lower risk for infection. Bottled water was found to be a source of multiresistant gram-negative bacteria among neutropenic patients in a British study (Wilkinson & Kerr, 1998), and one report was published about a disseminated mycobacterial infection in a patient with leukemia that was associated with a contaminated showerhead (Kauppinen, Nousiainen, Jantunen, Mattila, & Katila, 1999).

Protective Clothing and Environments Numerous studies have assessed the effect of laminar airflow or HEPA filtration (Ohira, Shibata, & Ise, 1983; Oren et al., 2001; Pizzo, 1981; Talbot & Pizzo, 1980; Ueda et al., 1983). Some of these studies, however, tested several interventions simultaneously (e.g., chemoprophylaxis, protective clothing, and sterile food), making it difficult to determine whether independent effects of individual interventions were present. Although most published studies have demonstrated some protective effect of laminar airflow and HEPA filtration against infections, particularly aspergillosis (Akiyama, Mori, Tanikawa, Sakamaki, & Onozawa, 1994; Loo et al., 1996; Withington et al., 1998), no measurable effect has been found on rates of remission or mortality (Fenelon, 1995). More

recently, a new type of clean room was compared to standard laminar airflow for preventing infections in neutropenic patients. Significantly lower rates of pneumonia were documented in patients housed in the new room, but, at present, this technology is not available in the United States (Shinjo et al., 2002).

Hygiene and Oral Care

Because a large proportion of infections in patients with neutropenia is associated with their own microbial floras (Carter, 1994), personal hygiene may be one important preventive strategy. Aside from studies of hand hygiene, however, the evidence of an association between antiseptic bathing and reduced risk of infection is contradictory (Larson, 2001). No studies of antiseptic bathing were found that are specific to the neutropenic population. Nevertheless, antiseptics have been shown in other populations to reduce microbial counts on the skin (Byrne, Napier, & Cuschieri, 1990; Byrne, Napier, Phillips, & Cuschieri, 1991) and their use most likely is prudent for neutropenic patients. Products containing chlorhexidine gluconate generally are used because of their sustained activity. Mucositis, ulcerative lesions, and other mouth problems are a frequent cause of morbidity among many patients with neutropenia and those undergoing radiotherapy and pose challenging nursing management problems (Alvarado, Bellm, & Giles, 2002; Garden, 2003; Vissink, Burlage, Spijkervet, Jansma, & Coppes, 2003). Several recent single-intervention studies using 0.2% chlorhexidine mouth rinse (Cheng, Molassiotis, & Chang, 2002), a calcium

phosphate mouth rinse (Papas et al., 2003), or topical application of honey (Biswal, Zakaria, & Ahmad, 2003) have reported positive results.

6. The application of the Self-care deficit theory; the researcher applied the SCDT in 3 aspects

6.1 Applied the perspective of theory to guide the research

6.2 Clarified the variable and identified the relationship between independent and dependent variable

6.3 Guided for the program development

Overview of Orem's theory

Orem's theory provides a comprehensive base to nursing practice. It is functional in the different fields of nursing. Orem (2001) describes the Self-Care Deficit Nursing Theory (SCDNT) as a general theory of nursing .General theories of nursing are applicable across all practice situations in which persons need nursing care. It is made up of the three interrelated theories of self-care, self-care deficit, and nursing systems. A peripheral concept, basic conditioning factors, applies to all of the theories (George, 2010) Dorothea Orem's Self-Care Deficit Theory focuses on each "individual's ability to perform self-care, defined as 'the practice of activities that individuals initiate and perform on their own behalf in maintaining life, health, and well-being.'" The Self-Care or Self-Care Deficit Theory of Nursing is composed of three interrelated theories: (1) the theory of self-care, (2) the self-care deficit theory, and (3) the theory of nursing systems, which is further classified into wholly

compensatory, partial compensatory and supportive-educative. It is discussed further below.

Within Orem's general theory there are three constituent theories. One of these is the theory of *self-care deficit*. This theory concerns the health-related limitation of individual to engage in the continuing performance of care measure to control or in some way manage factors are regulatory of their own or their dependent's functioning and development. This theory delineates when nursing is needed. Nursing is required when an adult (or in the case of a dependent, the parent or guardian) is incapable of or limited in the provision of continuous effective self-care. Orem identified 5 methods of helping: acting for and doing for others, guiding others, supporting another, providing an environment promoting personal development in relation to meet future demands

and teaching another. In application of nursing theory the strengths and limitation analysis need to be addressed.

Orem's theory is considered a general theory with broad concepts and can be applied in many different situations, rehabilitation, emergency department, intensive care unit, medical-surgical, etc. where self-care requisites are the driving force for individuals and nurses. It is extremely contagious, used by nurses at all level from novice to expert in all area of practice (George, 2010). It is applicable to all of those who need nursing care and also applicable to all of situations in which

individuals (including children) cannot meet their entire self-care request (George, 2010, Biggs, 2008).

Contrarily, some of theoretical analysis evidence proposed the limitation of the theory in lacking of some concepts which are vital to nursing care especially psychological focuses (George JB., 1995). Although, there were evidence supported that theory focused more on physical care and gives lesser significant to psychological. However considering the assumption of theory, the application SCDT in area of psychology is possibility. The self-care model provided with the opportunity to develop an independent practice of nursing that is grounded in and reflective of nursing rather than medicine or psychotherapy. Psychiatric nurse able to clearly identify our unique contribution to psychiatric/mental health care. However, it is often difficult to begin to practice from the self-care model because it does require that revision the definition of clinical problems, the focus of nursing interventions and the criteria for evaluation of nursing care. Theory user must change the way to look at patients and nursing practice by shifting focus from the individual's psychological problems, conditions, and symptoms to the individual's ability to meet self-care requisites. The goal of the independent practice of nursing is to assist the individual to meet self-care demands and thus self-care requisites in living day-to-day. Clinical problems will be expressed as actual or potential self-care deficits such as inability to decide and/or to act to engage with others. Clinical

problems are not expressed in terms of psychological problems such as low self-esteem, uncontrolled hostility, inappropriate dependency, or delusional thinking. Nurses will certainly need to recognize and understand psychological problems and psychiatric conditions but these problems are viewed as factors that affect the person's ability to meet self-care demands rather than clinical problems that require nursing care. The specific concern of nursing will be the person's self-care behaviors not the person's psychological problems or psychiatric symptoms. Nursing care is needed because an individual has a self-care deficit, not because an individual has a psychological problem or psychiatric

condition. (P.R., 1990)

The researcher’s opinion regarding the theory are, Orem’s theory is practical and applicable theory for both hospitalize and home care setting. This theory enable nursing competence to develop the unique intervention. Nurse capable to apply the theory with various dimension. The theory is powerful in generalize.

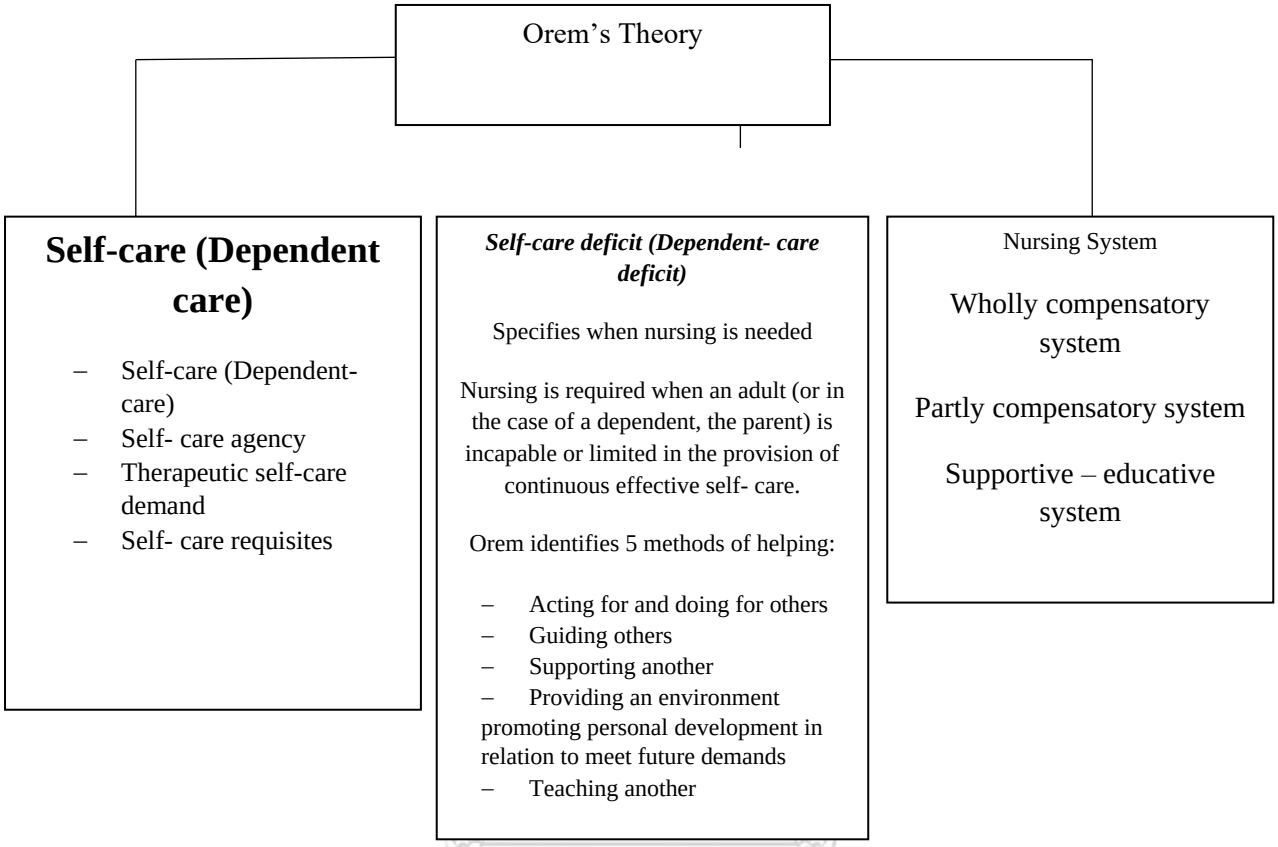


Figure 1 Orem's Theory Model

6.1 Applied the Orem's Self-care Deficit Theory to guide the research

This study was guided by the conceptual framework of Orem's Self-care Deficit Theory. Central to this theory is that people experience health-related limitations that render them incapable of providing self-care or dependent care. Self-care is defined as "[t]he practice of activities that individuals (or their designee) initiate and perform on their own behalf in maintaining life, health, and well-being" (Orem, 2001, p. 43). When discussing a preschool age child with ALL Preschool age children with ALL will develop gross motor strength they become more independent and begin to focus more on adults and children outside of the family. They will want to explore about the things around them even more. So preschool age children with ALL take more risk to infection than younger age. Preschool children want to touch, taste, smell, hear, and test things for themselves. They are eager to learn. They learn by experiencing and by doing. Preschoolers learn from their play. They are busy developing skills, using language, and struggling to gain inner control. They risk to approach the causes of infection by direct contact to pathogen or indirect contact from utensil, child stuff, water or diet. Pre-school age remain need care giver in taking care themselves in many daily routine activities, and when they turn to be the patient and from the effect of disease and treatment can caused them limited in self-care ability. Especially the complicated behaviors such a taking medicine,

prevent themselves in some kind of harm. So the family caregiver is really significant to take a role of providing appropriate care to avoid opportunistic infections.

The caregivers upon whom the child is dependent becomes the “agent” of the child’s care. The caregiver’s abilities are described as their “dependent care agency.” The purpose of self-care or dependent-care action is to meet dependent-care requisites. Within this framework, the following propositions have been set forth: (a) dependent-care is the responsibility of the individual; (b) people who participate in their own dependent-care already possess relevant knowledge and skills, rooted in science and/or culture, but they often need health professionals to supplement their dependent-care abilities; (c) deficits in dependent-care result from a lack of knowledge about the situation and/or the available options for self-care agency; and (d)dependent-care behaviors which meet the individual’s dependent-care requisites lead to outcomes of improved life, health, and well-being.

6.1.1 Dependence-care demand of caregiver

Dependent-care demand defined as totality of dependent care actions to be performed for some duration in order to meet dependent care requisites by using valid methods and related sets of operations and actions". Dependent care demand of caregiver in this study was infection prevention behaviors were conceptualized within health deviation dimension consist of

(1) Medication administration aims to solve the condition of neutropenia and other immunological deficiencies and also use the medication for prophylaxis and pre-emptive antimicrobials.

(2) Infection control are the acts of caregiver aim to avoid opportunistic infection for their child. Including the element of strictly hand washing, use facial mask, keep patient good personal hygiene, stickily aseptic technique, stickily clean food and drink, avoid to closed contact with sick person, avoid crown area, avoid to use cups, eating utensils, or toothbrushes used by others.

(3) Infection surveillance refer to the acts of caregiver to observe, evaluate, and provide appropriate care when their child present sign and symptom of infection

6.1.2 Preschool age children: a dependent person

Preschool age is refer to children with ages 3 years to 6 years they want to touch, taste, smell, hear, and test things for themselves. They are eager to learn. They learn by experiencing and by doing. Preschoolers learn from their play. They are busy developing skills, using language, and struggling to gain inner control. Preschoolers want to establish themselves as separate from their parents. They are more independent than toddlers. They can express their needs since they have greater command of language. The preschool age children are not achieve in self-care themselves in many daily routine activities and when they turn to the patient and the effect of disease and treatment school age patient will be limited in self-

care ability. Especially the complicated behaviors such a taking medicine, prevent themselves in some kind of harm. So the family caregiver is really significant person to take a role of providing care.

When discussing a preschool age child with ALL Preschool age children with ALL will develop gross motor strength they become more independent and begin to focus more on adults and children outside of the family. They will want to explore about the things around them even more. So preschool age children with ALL take more risk to infection than younger age. Preschool children want to touch, taste, smell, hear, and test things for themselves. They are eager to learn. They learn by experiencing and by doing. Preschoolers learn from their play. They are busy developing skills, using language, and struggling to gain inner control. They risk to approach the causes of infection by direct contact to pathogen or indirect contact from utensil, child stuff, water or diet. Pre-school age remain need care giver in taking care themselves in many daily routine activities, and when they turn to be the patient and from the effect of disease and treatment can caused them limited in self-care ability. Especially the complicated behaviors such a taking medicine, prevent themselves in some kind of harm. So the family caregiver is really significant to take a role of providing appropriate care to avoid opportunistic infections.

6.1.3 Dependent-Care Agency of caregiver (DCA)

The elements of DCA require that the caregivers have the capabilities to know the therapeutic self-care demand and self-care abilities of those who are dependent on them. They must also possess the skills needed to regulate the development or exercise of SCA of the dependent. DCA is “other-directed,” that is, the actions taken and decisions made are for the purpose of helping another person, not one’s self; however, actions taken on behalf of another may be beneficial or harmful to the self.

The development of DCA by individuals is usually a response to needs of family members or friends for help with their continuing SC. DCA is developed to meet existent and emerging needs of the persons to be helped or taken care of. More likely than not, the primary focus in its development is mastery of the productive operations of SC. When productive operations must be adjusted to specific human and environmental conditions, there is a need for the development of capabilities for performing estimative and transitional operations of self-care. There is always a need for development of capabilities to recognize emergency situations and to act promptly and effectively.

Dependent-care agency is certain “knowing and doing” capabilities that are necessary for the actions needed to meet self-care care requisites of those who cannot care for themselves, including children with ALL. These capabilities include

learned skills such as reading, writing, and counting, as well as verbal and perceptual skills (Orem, 1995). In the present study, DCA is conceptualized as the capabilities of the family caregivers to know and meet their child's therapeutic self-care demand and also exercise and continue to develop dependent care capability. Dependent-care agency consists of many levels; foundational capabilities and dispositions, ten power components and operational capabilities. Operational capabilities involve the ability to perform deliberate actions, which includes estimative, transitional, and productive operation. Estimative operation is seeking knowledge and understanding about a situation and what should be done to control that situation. Transitional operation is making a decision about dependent-care and productive operation is actions for meeting dependent-care demands, monitoring dependent-care practice (i.e., actions, results, effects), and decisions about subsequence actions. People can make a decision (transitional operation) to begin and maintain dependent-care actions (productive operation) if they have success in their investigation about their dependent-care (estimative operation). According to Orem, dependent-care requires learning and the use of knowledge. Knowledge includes both scientific and commonsense knowledge. People use scientific and commonsense knowledge along the state of deliberate action of dependent-care. In this study dependent care agency of caregiver were as

- The ability to acquire knowledge regarding to infection prevention

- The ability to make judgment regarding to infection prevention

- The ability to perform infection prevention behavior

6.1.4 Dependent Care Deficit (DCD)

DC is provided in response to the DC demand. The purposes of DC are presented in the statement of the theory. The following statements characterize the DCD.

1. DCD is a function of the self-care limitations of the dependent.

2. DCD is constructed from the self-care deficit; it is not the same in that it is a summation of care measures that require the actions of another person.

3. DCD exists within the dependent and must be known by the DC agent in order to develop a DC system to meet that demand.

4. In situations where the dependent is mature or maturing, knowing the care demand is a joint action of the dependent and the DC agent.

5. In infants and children, the expression of demand that is the basis of action is constructed by the DC agent in terms of the particularized SC requisites of the dependent.

6. In situations where the dependent is a mature or maturing person who is unable to participate in making known the DCD, the DC agent constructs expression of the demand. This may require consultation from professionals.

7. Attributes of the DCD vary based on the nature of the relationship of individuals making up the DC unit and the nature of the dependency, which may be related to age, developmental state, and/or health state.

8. The quantity and quality of DC required by an individual are a function of the complexity of the individual's self-care demand and nature of the self-care limitations. When DC occurs within the family, it is a specialized family operation that requires management. The family is seen as the most common setting within which DC occurs and it conditions the DC system. When the power and capacities of the caregivers to meet their dependents' demand are not adequate, there arises dependent-care deficit indicates the need for nursing interventions.

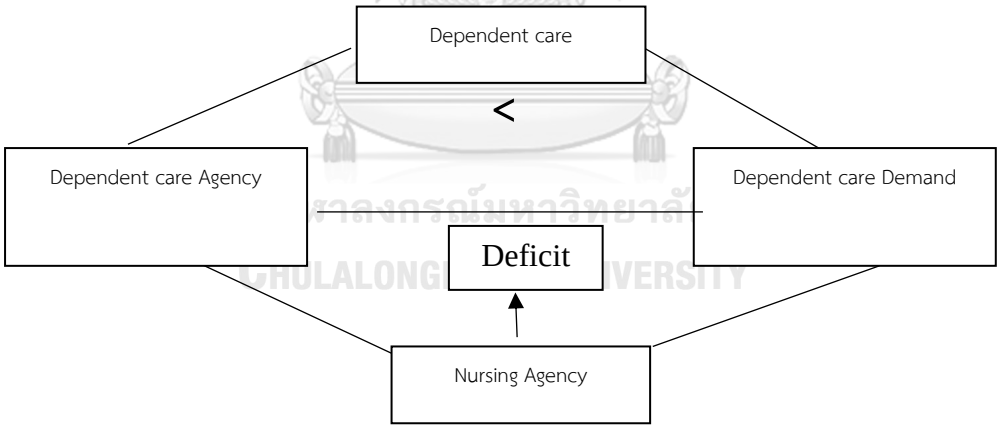


Figure 2 Dependent care deficit framework

6.2 Clarified the variable and identified the relationship between independent and dependent variable

According to SDNT is the grand theory with high level of abstract, the theoretical substruction was required to derive the construct level into variable level. Dependent-Care Agency (DCA) is a construct of great interest, the dependent care agency such learning results in development of the powers for action identified previously as power components of dependent-care agency. (Orem, 2001). This discussion of theory subtruction aims to identify the dependent variable in a study, analyzes the levels of abstraction among variables and also identify the operational definition of those variables. The concept of self-care agency (Dependent-care agency) appeared in the second edition of Orem's basic text (1980). In 1979, the NDCG presented self-care agency as being comprised of three types of human abilities (personal traits). Although this view is incorporated, to some extent, into the third edition of Orem's basic text (1985), it was presented as a definitive view in her 1987 writings and continued in the fourth edition of the text (1991).

According to this view, dependent-care agency consists of three types of personal traits that give an individual the ability to perform self-care actions. The first are foundational traits, which consist of basic personal abilities regarding sensation, perception, memory, and orientation and are related to the person's ability to perform any type of deliberate action. The second are enabling traits (power

components) which are related specifically to an individual's ability to engage in dependent-care. There are 10 power components (enabling traits) that include a repertoire of dependent-care skills, the valuing of health, energy for dependent -care, and dependent -care knowledge The third are operational traits (dependent -care operations), which are related to an individual's ability

Therefor 10 power components are the most significant enabling traits (power components) which are related specifically to an individual's ability to engage in dependent-care. There are ten power components according to Orem

1. Ability to maintain attention and exercise requisite vigilance with respect to self as self-care agent and internal and external conditions and factors significant for self-care

2. Controlled use of available physical energy that is sufficient for the initiation of the movements required to initiation and completion of self-care operations

3. Ability to control the position of the body and its parts in the execution of the movements required for the initiation and completion of self-care operations.

4. Ability to reason within a self-care frame of reference

5. Motivation (i.e. goal orientations for self-care that are in accord with its characteristics and its meaning for life, health, and well-being)

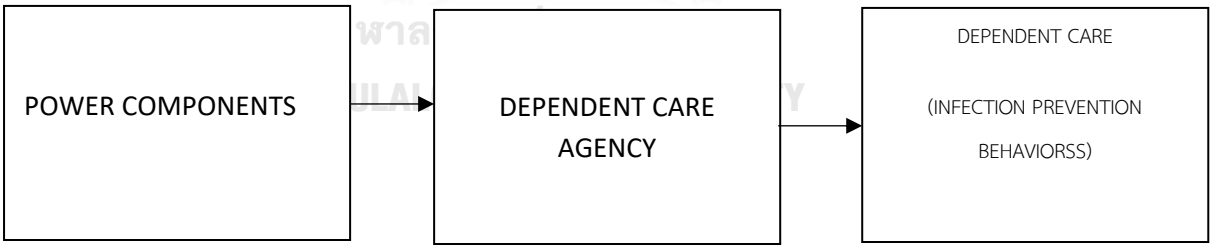
6. Ability to make decisions about care of self and to operationalize these decisions

7. Ability to acquire technical knowledge about self-care from authoritative sources, to retain it, and to operationalize it

8. A repertoire of cognitive, perceptual, manipulative, communication, and interpersonal skills adapted to the performance of self-care operations

9. Ability to order discrete self-care actions or action systems into relationship with prior and subsequent actions toward the final achievement of regulatory goals of self-care

10. Ability to consistently perform self-care operations, integrating them with relevant aspects of personal, family, and community living



Independent variable dependent variable

Figure 3 Linkage between Independent variable and Dependent variable

6.3 Guided for the program development

In order to perform dependent care operation, set of 10 power components are required. However, all 10 PCs there are some PCs that a person can develop on their own with sufficient physical maturity. For example, the ability to control one's physical energy to be able to perform an activity, or Ability to control the position of the body and its parts in the execution of the movements required for the initiation and completion of self-care operations. In addition, some PCs are influenced by specific external factors such as social and cultural conditions. Therefore, in reviewing relevant evident underneath the SCDT theoretical framework, empirical data were found on whether a person would have enough DCA to develop health care behaviors. There are four essential power components that affects health care behavior were as having motivation to perform dependent care, ability to make decisions about dependent care, ability to acquire technical knowledge about dependent care and ability to perform dependent care These power components develop according to performed operation through which specific decisions are made, purposes formulated, and productive actions generated. The outcome of theoretical substruction with supported by trustworthiness evidences provide four important power components that affect dependent care agency (Biggs, 2008; Burley Moore, 2004; Gaffney & Moore, 1996; Souza, 2002; Taylor, Renpenning, Geden, Neuman, & Hart, 2001)The development of dependent-care agency consist of, ability

to acquire technical knowledge, ability to make decision about care, ability to perform care and motivation.

Consequently, the program promoting infection prevention behavior was developed within the specific goals of enhancing dependent care agency through the nursing intervention. Those nursing interventions manipulate all 4 significant power components by used the method of guiding, teaching, coaching and providing the developmental environment. Therefore, the program was developed under the purpose were as follow

- Enhancing ability to acquire technical knowledge regarding infection prevention behavior
- Enhancing ability to make decisions about infection prevention behavior
- Enhancing ability to perform infection prevention behavior
- Promoting motivation to perform infection prevention behavior

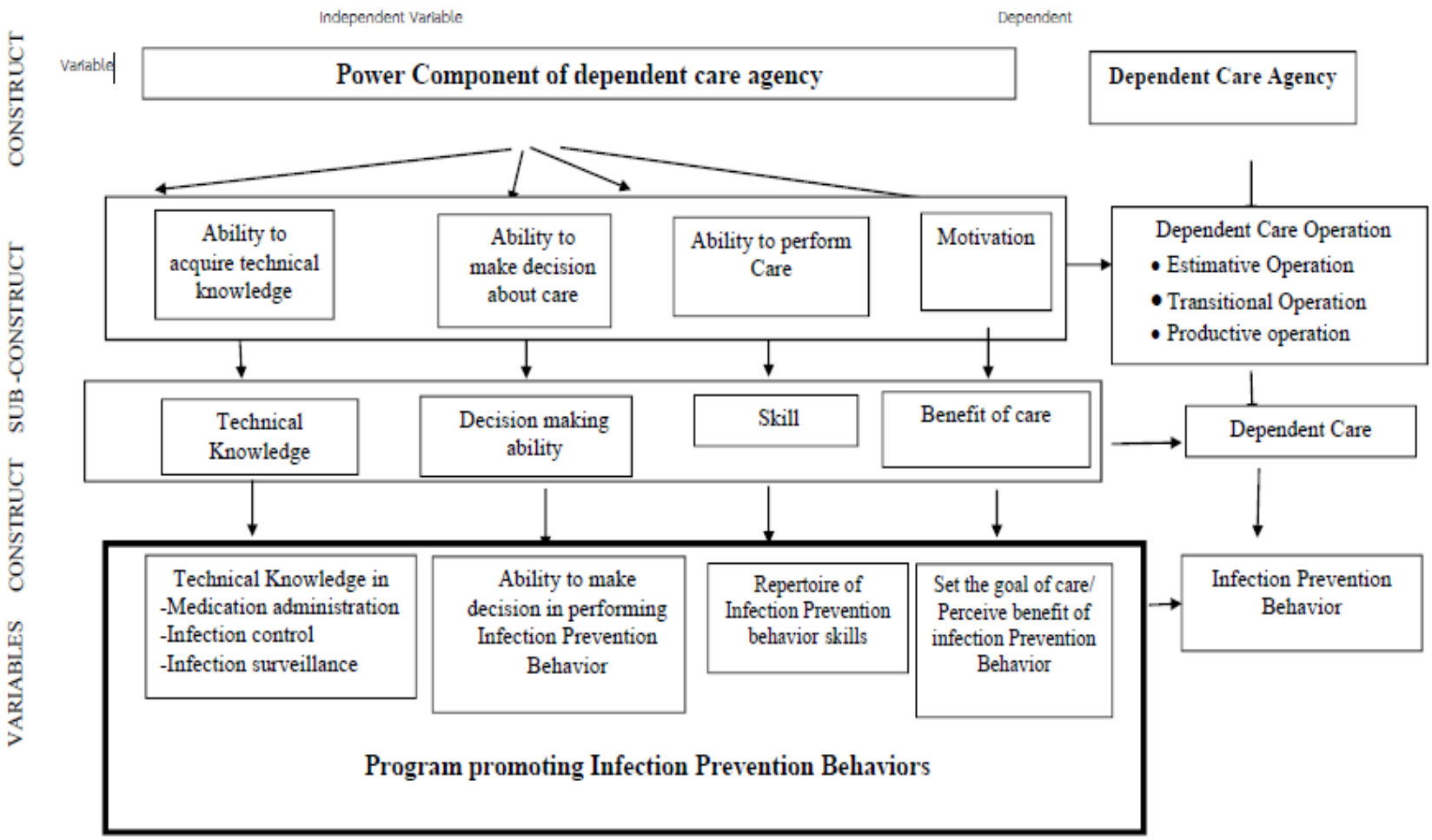


Figure 4: The theoretical substruction

7. The development of program promoting infection prevention behavior

The program promoting infection prevention behavior (PPIPB)

The researcher developed this program based the concept of dependent care agency in Self Care deficit Theory (Orem, 2001) and infection prevention behaviors in pediatric cancer guideline by American Cancer Society (2013) and Thai pediatric oncology group (2016). This program worked on promoting infection prevention behavior of family caregiver by improving infection prevention agency. The model was use for developing nursing interventions developed by the Nursing Science Department at Utrecht University (Gamel, Grypdonck, Hengeveld & Davis, 2001). The model consists of four stages: (1) problem definition (2) accumulation of building blocks for intervention design, (3) intervention design and (4) intervention validation.

(1) Problem definition

This stage aimed to identify a definition of the problem providing the focus of the intervention. The researcher paid attention to the nursing phenomena of interest to indicate the problem will be presented in the next paragraph.

Potentially factors associated with infection among children with ALL undergoing chemotherapy courses are the most clinically relevant from an infection supportive care perspective. Those factors are (1) child characteristics at diagnosis, (2) treatment and course characteristics and (3) risk behavior to infection. (Afzal, Ethier, Dupuis and et.al, 2009). For both factors, the characteristics at diagnosis and

treatment and course characteristics often have decreased neutrophil counts and increased risk of infection. To the best of our knowledge, we unable to control factors related to disease and its treatment. In the role of nurse professional, nurses could only providing patients with consistent treatment plans and caring for the treatment's side effect. On the other hand, for those last factor, "risk behavior to infection" can be manipulated by applying the nursing knowledge and nursing process. (Xiaomei, Kevin, Jeffrey and et al., 2009) Therefore, infection prevention behavior is the crucial behaviors in reduce risk to infection among leukemic patients. Especially, for dependent person and high risk to infection as preschool age children with ALL.

The risk behaviors to infection in preschool age children with ALL can be controlled by caregivers perform specifics infection prevention behaviors.(Lighter-Fisher et al., 2016; Maia Rda & Wünsch Filho, 2013; Pizzo, Rubin, Freifeld, & Walsh, 1991) Those behaviors are medication administration, infection control, and infection surveillance (American Cancer Society, 2013 and Thai pediatric oncology group, 2016). Unfortunately, there are many literatures and evidences propose the information related to inappropriate infection prevention's behaviors of family caregivers. There have been caregivers with poor practice regarding infection prevention behaviors, such as inappropriate preparing low bacterial diet (Shaker, Kareema and Mouroge, 2011), poor practice regarding oral hygiene care (El-sawy,

Ismaril, Magy and El-sam-man). Some caregivers have unrestricted hand washing before and after providing care to the patient, took the patient to high risk place to infection such as fresh market or crowded place, provide raw vegetable and fruit to the patient, allowed patient to eat inappropriate food, allowed their child having pet, unrestricted infection prevention regarding nutrition and unrestricted using protective equipment. (Pediatric department of Phramongkutklao hospital, 2016; Siripoon & Tangvoraphonkchai., 2014; Sonkongdang, Kantawang and Niyomkar, 2015)

Therefore, the problem of caregivers of preschool-age children with ALL perform inappropriate infection prevention's behaviors refer to the family caregivers of preschool-age children with ALL cannot achieve in doing the behavior of medication administration, infection control, and infection surveillance appropriately.

(2) Accumulation of building blocks for intervention design

Problem Analysis

Problem in lacking of effective infection prevention's behaviors of family caregivers in pediatric malignancy is the worldwide problem that occur in many countries. There have been caregivers with poor practice regarding infection prevention behaviors, such as inappropriate preparing low bacterial diet (Shaker, Kareema and Mouroge, 2011), poor practice regarding oral hygiene care (El-sawy, Ismaril, Magy and El-sam-man).

On the same line with situation in Thailand, many literature reported inappropriate infection prevention of family caregivers in children with cancer. Such as inappropriate medication administration and nonrestrictive infection control activities. Some caregiver have unrestricted hand washing before and after providing care to the patient, took the patient to high risk place to infection such as fresh market or crowded place, provide raw vegetable and fruit to the patient, allowed patient to eat inappropriate food, allowed their child having pet, unrestricted infection prevention regarding nutrition and unrestricted using protective equipment. (Pediatric department of Phramongkutklao hospital, 2016; Siripoon & Tangvoraphonkchai., 2014; Sonkongdang, Kantawang and Niyomkar, 2015)

Based on OREM Self-care deficit nursing theory, one of the propositions in the theory of self-care is that “engagement in dependent-care involves performance of operations to estimate or establish what can and should be done, to decide what will be done, and to produce care” (Orem, 2001, p. 144). Therefore, caregiver or dependent care agent will achieve in dependent care (infection prevention behavior), they have to engage dependent care agency.

Furthermore, the existing evidences provide the data associate with caregiver lacking of dependent care agency. Such as, caregiver have insufficient knowledge including ability to acquire or seeking knowledge in caring their child. (Jinsupawong, 2004; Gelesson and et.al, 2012; Saeui and et. al., 2011). Caregivers need sufficient

knowledge regarding infection prevention to putting the knowledge into practice. Some family caregivers having lack of competence to judgments and decision making in caring their child including perform infection prevention behavior. (Balling and McCubbin, 2001; Pediatric department of Phramongkutklao hospital, 2016). And also family caregivers had lack of skill and ability to perform appropriate infection prevention behaviors. (Balling, McCubbin, 2001, Hd,asan, Hussein & Hashim, Shaker, Kareema and Mouroge, 2011, Siripoon & Tangvoraphonkchai., 2014; Sonkongdang, Kantawang and Niyomkar, 2015).

The outcome of the problem analysis indicated that the caregiver of preschool age children with ALL have insufficient infection prevention behavior agency to achieved in infection prevention behavior. Explanation within the framework of dependent care agency as 1) the family caregivers have insufficient ability to acquired knowledge regarding infection prevention 2) the family caregivers have insufficient ability to judgment od make decision regarding infection prevention and 3) the family caregivers have insufficient ability to perform infection prevention.

Current Practice Analysis

The information related to the various interventions to enhance caregiver's behavior regarding infection prevention in children with acute lymphoblastic leukemia were studied. There has been found the additional interventions

conducted to promote infection prevention behavior in caregivers of children with ALL as the following. The study of Sen-Ngam ,Pratepchaikul and Phuwathananon (2005), who used an educational program for improving maternal knowledge and practice in caring for children with leukemia. The study revealed that there was a significant difference between maternal knowledge in control and experimental groups ($p < 0.05$) but no significance difference ($p > 0.05$) in maternal practice. Similarly to, Promwisest and college (2013) conducted the caregiver's empowerment program to improve home care behavior of caregivers in preschool age children with leukemia, the result showed that program had not significantly improve behaviors of caregiver. The researcher suggested that in the future research should be develop a modified similar program to achieve for sustainable behavior.

Moreover, the study of Siripoon and Tangwiriyapong (2014) conducted the program of educative supportive based on Orem's self-care theory, on care behavior regarding beginning to end stage leukemic. For this study, one group pre-posted design was comprised, the result presented the mean score of caregivers' care behavior was significantly improved after intervention ($p<0.01$). However, this study did not provide sufficiency sample size (n=10). In the same line with, Jansong (2015) studied the effect of nursing intervention based on Pender's health promotion model on infection prevention behaviors in mothers of 1-5-year-old children with cancer undergoing chemotherapy. In this study there were significant improvements

in infection prevention behaviors of the participant in experimental group (P<0.05). But, insufficiency sample size (N=16, 8 in the treatment group and 7 in the control group) had been propose in conclusion.

Presently, it has been found a small number of the additional interventions conducted within specific objective to promote infection prevention behavior in caregivers of children with ALL. However, the result of some previous studies presented ineffective of conventional intervention. (Balling and McCubbin, 2001; Sen-Ngam, Pratepchaikul and Phuwathananon, 2005; Promwisest and college, 2013; Pediatric department of Phramongkutklao hospital, 2016). Unfortunately, although some studies provided statistic significantly in the result, but the authors could not represent strongly methodology to verify the effective of intervention. Some prior studies had inadequate sample size or used non parametric design. (Siripoon and Tangwiriyapong, 2014; Jansong, 2015). There has been lack of validity research to enhance infection prevention behavior of caregiver in preschool age children with ALL in Thailand.

Although the result of some former studies provide the effective of intervention. Contrary, prior researcher proposed the limitation of those nursing intervention as well. Most existing nursing intervention were developed as a standard nursing care. All participant were revived the same intervention, not specific to individual need. According to Self-care deficit Nursing theory (Orem, 2001), individual

need or requirement is significant factor influence to perception and learning. If the person have to receive too much information and out of their need, can be the barrier of ability to perform behaviors.

Moreover existing nursing intervention usually provide the program focusing on infection prevention behavior in hospital. There are a few studies aim to extend those behavior to home care. According to ALL require significant long-term follow-up and care interchange between hospital and home. Therefore it is necessary for caregiver to achieve in good infection prevention behavior in home situation as well.

Among the existing intervention, mostly intervention applied the method of teaching, coaching, guiding and psychosocial support. Even, the evidence supported the effective of those intervention technique. But for the independent patient with long-term care as this group of patient, the outcome of those intervention maybe not enough. The caregivers need to improve potential of care, besides necessary knowledge or caring skills. The family caregiver should be able to deal with emergency or unexpected situations. They require ability to acquire or seeking and gathering the resource of knowledge. Moreover, they should develop the decision making skill regarding the alternative situation.

(3) Intervention design

Program construction

The researcher developed the program by the application of Orem Self-care deficit theory .According to SDNT is the grand theory with high level of abstract, the theoretical substruction was required to derive the construct level into variable level.The dependent care agency such learning results in development of the powers for action identified previously as power components of dependent-care agency. (Orem, 2001).In order to perform dependent care, set of 10 power components are required. However, all 10 PCs there are some PCs that a person can develop on their own with sufficient physical maturity. For example, the ability to control one's physical energy to be able to perform an activity, or Ability to control the position of the body and its parts in the execution of the movements required for the initiation and completion of self-care operations. In addition, some PCs are influenced by specific external factors such as social and cultural conditions. Therefore, in reviewing relevant evident underneath the SCDT theoretical framework, empirical data were found on whether a person would have enough DCA to develop health care behaviors. There are four essential power components that affects health care behavior were as having motivation to perform dependent care, ability to make decisions about dependent care, ability to acquire technical knowledge about dependent care and ability to perform dependent care These power components develop according to performed operation through which specific decisions are made, purposes formulated, and productive actions generated. The outcome of

theoretical substruction with supported by trustworthiness evidences provide four important power components that affect dependent care agency(Carter, 1998; Dennis, 1997; Souza, 2002) The development of dependent-care agency consist of, ability to acquire technical knowledge, ability to make decision about care, ability to perform care and motivation. (Burley Moore, 2004; Gaffney & Moore, 1996)

Consequently, the program promoting infection prevention behavior was developed within the specific goals of enhancing dependent care agency through the nursing intervention. Those nursing interventions manipulate all 4 significant power components by used the method of guiding, teaching, coaching and providing the developmental environment. Therefore, the program was developed under the purpose were as follow

- Enhancing ability to acquire technical knowledge regarding infection prevention behavior refer to nursing activities of discussing and exchanging technical knowledge of appropriate information resources. Including, guidance the process of seeking useful resources for gathering trustworthiness information. Moreover, the intervention will provide significance health information, empowerment and promote confidence in knowledge seeking skill.

- Enhancing ability to make decisions about infection prevention refer to nursing activities to improved decisions making skills in complicated or unexpected situation regarding infection prevention behavior. By providing sufficient knowledge

through the teach-back technique and practicing decisions making skills by simulation teaching. Furthermore, providing the activities of discuss alternative situation, and guiding the way to overcoming or compensation for those limitations behavior.

- Enhancing ability to perform infection prevention behavior, refer to nursing activities that provide personal coaching via the demonstration and return demonstration technique regarding crucial skills of infection prevention such as drug administration, hand washing, facial mask using, and children's oral hygiene care.

- Promoting motivation to perform infection prevention behavior, refer to nursing activities that encourage the participants to assess their own infection prevention behavior ability and limitation, encourage participants to establish the goals of behavior, and motivate themselves for behavior change or maintain appropriate behavior.

All four power components were implemented through guiding, teaching, and providing the developmental environment. The phase of behavior development according to SCDT was consisted of 2 phases:

Phase1:Consideration and judgment period which will lead to action It is a period of analysis in order to understand circumstances that arise with oneself and environment, consider the consequences of actions and decide whether to act or not. This means having an estimative and transitional operation.

Phase2: The duration of action and the outcome of the action; this phase starts with deciding what to do, how to plan and then take action until the end of the action and achieves the goal or does not achieve the goal

The nursing intervention provide the method of guiding, teaching, coaching and supporting-providing the developmental environment. Comprised of four necessary power components of infection prevention behavior agency including, enhance ability to acquire technical knowledge regarding infection prevention behavior, enhance ability to make decisions regarding infection prevention behavior, enhance ability to perform infection prevention behavior, enhance motivation to perform infection prevention behavior.

Table 1 Nursing intervention and method of helping to support Power Components

Power Component	Nursing intervention
Promoting motivation *Helping method* - Guiding - Providing the developmental environment	-Discussed and analyzed the ability and limitation to behave infection prevention behavior. -encouraged the participant to establish the specific short and long term goal for achieving to perform infection prevention behavior - emphasize the caregivers as a significant person who indicate an improvement or worsening of their child conditions - used a combination of helping techniques; teaching, support guidance, consult, and providing a suitable environment, using the circumstances of a good relationship
Enhancing ability to acquire	- Provided content regarding benefit of infection prevention behavior and

Power Component	Nursing intervention
technical knowledge *Helping method* Guiding, Teaching	the harmful caused by neglect of infection prevention behavior -Discussed and exchanged technical knowledge of appropriate resources. Including guiding how to seek useful resources that they can gather the trustworthiness information. - individual advice approach for providing significance health information - Empowerment and promote confidence in performing behavior through positive reinforcement - Personal guiding: by using teaching method by providing teach-back technique for personal guiding in topic of “Infection Prevention Behaviors in children with ALL
Enhancing ability to make decisions *Helping method* Guiding, Teaching, and Providing the developmental environment	- Simulation teaching. provided VDO clip scenario “Which one what would you choose” and discuss alternative situation, provide the reasons for those decision and how to overcoming or compensation for limitations -Discussed and exchanged technical knowledge of appropriate resources. Including guiding how to seek useful resources that they can gather the trustworthiness information
Enhancing ability to perform behavior *Helping method* Guiding, Coaching, and Providing the developmental environment	- Personal coaching : demonstration and return demonstration the crucial skill of infection prevention: drug administration, hand washing, facial mask using, and children’s oral hygiene care Personal guiding: by using teaching method by providing teach-back technique for personal guiding in topic of “Infection Prevention Behaviors in children with ALL -Empowerment and promote confidence in performing behavior through positive reinforcement

According to SCDT, Orem did not mention specify time frame for behavior development. The theory focused on a person has achieved in DCA, they can develop DC, thus relying on empirical data. From existing research studies within the theoretical framework of SCDT, it was found the information regarding duration time of nursing activities to promote the dependent care agency with statistically significant increase in dependent care. The duration of the study was from 2 days to 4 weeks, with the number of meeting visits between 2 to 8 sessions of 10-60 minutes per visited, depending on the activity. The variation of time was largely dependent on the frequency visit and also, depending on the intensity of nursing activity.(Aish & Isenberg, 1996; Boonchuay, Sanasuttipun, Chintanadilok, & Sanpakit, 2016; Meijel, Gamel, Swieten-Duijfjes, & Grypdonck, 2004; Paprom & Tangworaphonkchai, 2014; Saeui, Chintanadilo, Sriussadaporn, & Sanasuttipun, 2009; Shoghi, Shahbazi, & Seyedfatemi, 2019; Siripoon & Tangvoraphonkchal, 2014)

Therefore, the nursing activities organized in this program specified the number of periods and the number of visits with consideration of

1. Length of pediatric patients to be hospitalized (usually 4 weeks), preliminary activity determination, and weekly activities (1 time per week) are required to ensure consistency of the program. The investigator and the caregiver can interact throughout the duration of the patient and caregiver in the hospital. To control other

complications such as getting information from the other resources outside the program.

2. The activity must be completed before the patient discharge. Because the researcher need to evaluate the results of the activities for the caregivers to perform infection prevention behavior at home.

3. Caregivers must be consistent in receiving nursing activities or teaching repeatedly and practicing until becoming proficient

Program instructional media

- The booklet for family caregivers: An education manual regarding infection prevention behaviors which consists of content were as, knowledge of disease, treatment, benefits of infection prevention behaviors and the detail related to infection prevention behaviors (medication administration, infection control, and infection surveillance). Including hand washing and facial mask used guidance.

- Video Clip Scenario “Which one what would you choose”: The video scenario of common situations that always occurred and have difficulty deciding practice behavior.

This scenario was provided within the supervision of researcher. There are 7 simulation situations consist of: medication administration problem, making decision in wearing face mask, children denial of oral care, making decision in hand washing, making decision in selecting appropriate diet, making decision in allowing children to

crowed place, and dealing with children with high grade fever. Total time of scenario was 20 minutes

- Caregiver's memo booklet: A notebook for recording problems and limitations that arise in performing infection prevention behavior at home.

Table 2 The summarization of the intervention process

Session	Nursing activities:	Time	Media
Session 1: First meeting 1st date admission	1. The researcher and participant discussed and analyzed the ability and limitation to behave infection prevention behavior. 2.The researcher encouraged the participant to establish the specific short and long term goal for achieving to perform infection prevention behavior	20 minute	Caregiver's memo booklet
Session2: Second meeting 2nd date of admission 2 parts of activities Part 1: Personal guiding Part 2: Personal coaching	1. The researcher will use teaching method by providing teach-back technique for personal guiding in topic of "Infection Prevention Behaviors in children with ALL" 2. The researcher demonstration and return demonstration the crucial skill of infection prevention: drug administration, hand washing, facial mask using, and children's oral hygiene care.	30 minute 40 minute	-The booklet for family caregivers
Session 3: Third meeting 8th date of admission	1. Simulation teaching. The researcher provided VDO clip scenario "Which one what would you choose". After watching clip scenario, the participant will be encourage to make decision in those situation. The researcher will convince the participants to discuss alternative situation, provide the reasons for those decision and how to overcoming or compensation for limitations	30 minute	Video Clip Scenario
Session4: Fourth meeting 15th date of admission	reviewed all significant content /discussed to supply and regulate essential environment by encourage the participant to evaluate the limitation that may arise when returning home and plan the solution to manage	30 minute	-The booklet for family caregivers

Session	Nursing activities:	Time	Media
	housewares environment for promoting infection prevention behavior / Infection prevention behavior planning		
Session5: Fifth meeting on the last date of admission	1. The researcher review all content by discussing capability and limitation of the caregiver. Motivation and empowerment for those improvement behavior. Adjust or provide beneficial information for inappropriate behavior. 2 Evaluation of infection prevention behavior plan 3. Assess the ability to practice preventive behavior and provide additional suggestions for incomplete sections 4. Summary of care plans for prevention infections at home 5. Guiding communication methods in case caregivers need additional advice	40 minute	The booklet for family caregivers

(4) Intervention validation.

The program promoting infection prevention validation

The researcher developed the program by the application of Orem Self-care deficit nursing theory with consultant of major advisor. The program was validate by a panel of five experts. (Four of pediatric nursing instructors who are specialty on Orem Self-care deficit nursing theory and one is advanced practice nurse in pediatric malignancy). Experts were asked commented on the construct and content including possible revision, the content were revised in the assumption of 3 of 5 experts

indicated that content or construct are not relevant to the concept or inappropriate to deliver. There are no issue of major revision regarding the program promoting infection prevention.

The instructional media validation

- The booklet for family caregivers, the story board of video clip scenario and caregiver's memo booklet were validated by the same panel of expert. The revision were occurred in the assumption of 3 of 5 experts indicated that those media need to adjust. The 3 expert commented regarding the text size of the booklet for family caregivers were too small, the text font were difficult to read and some pictures were not related to the contents. Therefore, the researcher revised the booklet for family caregivers according to the suggestion of the expert.

The program was try-out on 10 family caregivers of preschool age children with ALL who had similar characteristics to the participants in the study. The purpose for conducting the pilot study were (1) to determine the feasibility of the intervention, (2) to identify problems of an experimental intervention. The results of try-out indicated that the intervention feasibility to delivery.

8. Related research

According to the previous studies provide the information in appropriate infection prevention behaviors by the following. Wannita, Seepan and Srimana.(2015) studied factors influencing caregivers' behaviors regarding nutritional care for preventing infection in leukemic children with chemotherapy induced neutropenia.

The finding showed most of the caregivers reported their behaviors regarding nutritional care in leukemic children with chemotherapy induced neutropenia as follows: they always selected and provided high caloric and low bacterial diets, provided snacks between meals, and avoided providing contaminated food. But the finding present some inappropriate behaviors regarding nutritional care for preventing infection is majority of them reported always were not washing fruits and rinsing utensils with hot water.

Jinsupawong (2004) found that a majority of caregivers (87.5%) needed information related to providing care for pediatric patients with leukemia at home. A survey of caregivers for pediatric patients with leukemia revealed that the majority of them wanted to be able to participate in treatment planning and decision making (Balling, McCubbin, 2001). They also wanted to receive knowledge and information related to pathology, treatment, and caring procedure for pediatric patients with leukemia both in hospital and at home. The health care team can have a significant impact on helping families get through their problems in various ways, such as coordinating support groups for caregivers for cancer patients (Mc-Grath, 2001). Caregiver practice has a significant impact on the condition of leukemia patients, whether they are at home or hospitalized. Promoting opportunities to take care of leukemia patients, participate in caregiver support groups, as well as discussions

between nurses and caregivers can empower caregivers by enhancing their competence in caring. (Jinsupawong, 2004).

The information related to the various interventions to enhance caregiver's behaviors regarding infection prevention in children with acute lymphoblastic leukemia were studied. In Thailand, it has been found the additional interventions conducted to promote infection prevention behaviors in caregivers of children with ALL as the following. The study of Sen-Ngam ,Pratepchaikul and Phuwathananon (2005), who used an educational program for improving maternal knowledge and practice in caring for children with leukemia. The study revealed that there was a significant difference between maternal knowledge in control and experimental groups ($p < 0.05$) but no significance difference ($p > 0.05$) in maternal practice. Similarly to, Promwisest and college (2013) conducted the caregiver's empowerment program to improve home care behavior of caregivers in preschool age children with leukemia, the result showed that program had not significantly improve behaviors of caregiver. The researcher suggested that in the future research should be develop a modified similar program to achieve for sustainable behavior.

Moreover, the study of Siripoon and Tangwiriyapong (2014) conducted the program of educative supportive based on Orem's self-care theory, on care behavior regarding beginning to end stage leukemic. For this study, one group pre-posted design was comprised, the result presented the mean score of caregivers' care

behavior was significantly improved after intervention ($p<0.01$). However, this study did not provide sufficiency sample size (n=10). In the same line with, Jansong (2015) studied the effect of nursing intervention based on Pender's health promotion model on infection prevention behaviors in mothers of 1-5-year-old children with cancer undergoing chemotherapy. In this study there were significant improvements in infection prevention behaviors of the participant in experimental group ($P<0.05$). But, insufficiency sample size (N=16, 8 in the treatment group and 7 in the control group) had been propose in conclusion.

Saeui, Chintanadilok, Sriussadaporn and Sanasuttipun(2009) conducted the empowerment program based on Gibson empowerment model to evaluate effects of caregivers' competence in caring for preschool children with acute leukemia undergoing chemotherapy. After 4th week of program, the results revealed that the program can significantly improve knowledge and caregiver's competence of caregiver in caring preschool children with acute leukemia undergoing chemotherapy ($p<0.01$).

9. Conceptual framework

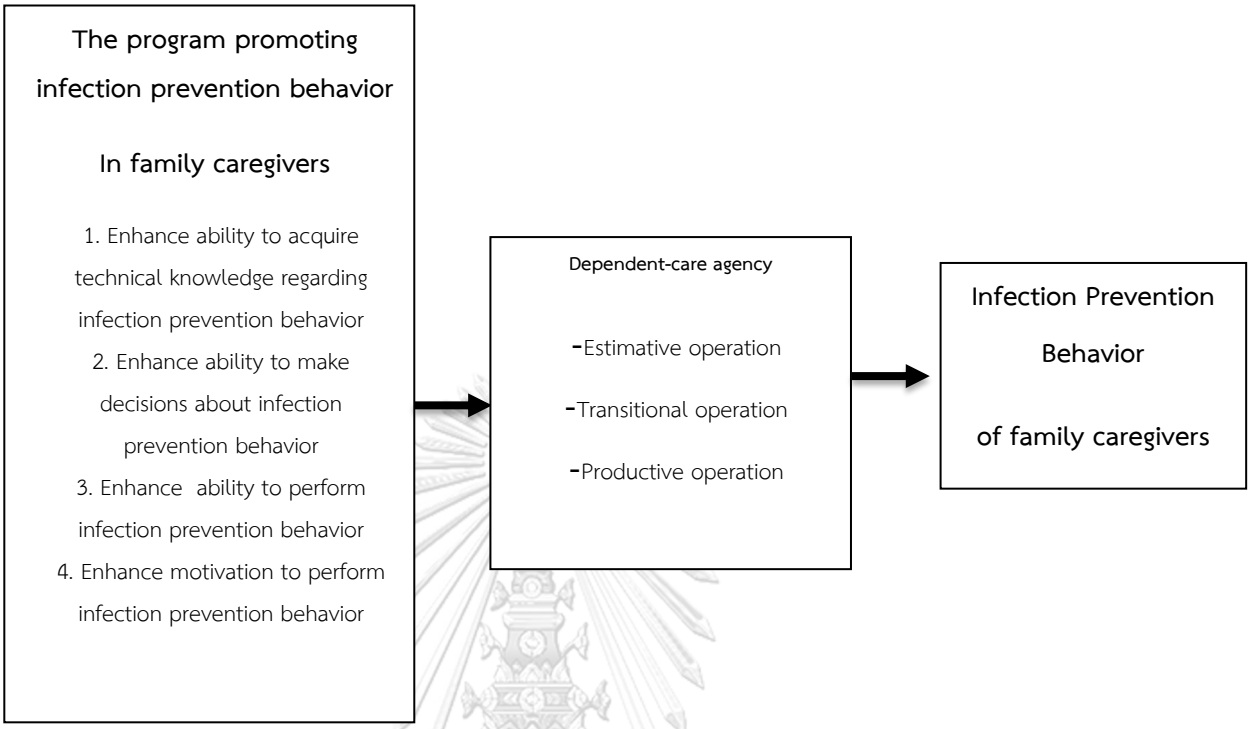


Figure 5 Conceptual framework

CHAPTER III

METHODOLOGY

This chapter describes the research methodology applied in this study, including research design, setting, population and sample, sample selection, research instrument, protection of the rights of human participants, data collection, and data analysis

Research Design

The study was quasi-experimental with a two-group pretest and posttest design. The design was used to compare infection prevention behaviors among family caregivers of pre-school age children with acute lymphoblastic leukemia between the control group and the experimental group. The outcomes were infection prevention behaviors of family caregivers. The participants in the experimental group received the PPIPB while the participants in the control group received conventional care. Data was gathered two times: 1) after participants consented to participate in the study and 2) one week after completed the program. The research design of the study was shown in Figure 6

O1	X	O2	Experimental group
O3		O4	Control group

Figure 6 Research Design

Remark

O1, O3 Refer to pre intervention and pretest

O2, O4 Refer to post intervention and posttest about 1 week after discharge

X Refer to the program promoting infection prevention behavior (PPIPB)

Setting

This study was conducted at the pediatric in-patient unit, Phramongkutklao Hospital**,** Bangkok during May – October 2020.

Population and sample

Population

The target population for this study was the family caregivers of pre-school age children with acute lymphoblastic leukemia (age3-6) who were admitted for chemotherapy treatment in pediatric IPD, Phramongkutklao Hospital.

Samples of the study

1. Sample selected

The participants were purposively selected based on their eligibility. The researcher first reviewed the appointment schedule, medical records regarding the chemotherapy therapy treatment and interviewed the family caregivers to determine

whether the participants were eligible. Prospective participants fulfilling all of the following:

Inclusion Criteria

1) Being a major family caregiver (father/mother/relative) of preschoolers (3-6 years old) with ALL who take care of a daily routine care as well as the various comforts of the children throughout the time the child was hospitalized at least 12 hours a day both at home and in the hospital.

2) Having experience in taking their child after receiving chemotherapy treatment.

3) Age between 18-60 years

4) Able to speak, write, and read in Thai

5) The family caregiver whom able to use online communication tools*

*Remark: added according to revision of participants approaching technique during the situation of Coronavirus Disease 2019 (COVID-19) outbreak.

Exclusion Criteria *Family caregiver:* The family caregiver who did not continually participate in the program due to any kind of causes.

2. Sample size

The designation for the size of the sample size should be calculated by using power analysis from the effect size recommend by Cohen (1988). The researcher afforded to find the similarity literature to calculate the sample size. The previous

experimental research design, which closest to this study, was presented only one study. Entitle of The Effects of an Empowerment Program on the Competence of Caregivers in Caring for Preschool Children with acute lymphoblastic leukemia undergoing chemotherapy (Saeui, Chintanadilok, Sriussadaporn and Sanasuttipun, 2009). Calculation of the effect size (d) showed a large sample group requiring groups of 26 subjects each. Therefore, an attrition rate of 10% was added for protection against losses in the sample group for a total of 30 subjects each.

However, effect size should be calculated based on the prior study that has similar characteristics of samples in this study. But, the intensive literature review could not found the existing study which conducted a similar intervention to the same population, theory and not measures the same dependent variable.

According to Polit and Beck (2008), the suggestion was if there was no prior research, the researchers can estimate whether the expected effect is small, medium, or large. The value of effect size in a two-group test of mean differences is estimated at 0.50 for medium effects because most nursing studies cannot expect effect sizes in excess of 0.50 (Polit & Beck, 2008). Additionally, an attrition rate of 10% will be anticipated. However, Willson Van Voorhis & Morgan (2007) stated that given a medium to large effect size, 30 participants per cell should lead to about 80% for the independent samples t-test, matched sample t-test are statistics designed to detect differences between or among groups. Consequently, the total

number of participants is the study is 60 cases that will be randomized (selection with replacement) into the experimental and control groups with 30 participants in each group.

Unfortunately, on account of the time for the data collecting period, the hospital policy was changed owing to the situation of Coronavirus Disease 2019 (COVID-19) outbreak. Those situations effected the protocol of treatment and the number of patients who were admitted to the hospital. The decline in the target population affected the size of the sample. Eventually, the researcher couldn't recruit the number of a participant as expected. The total family caregivers were recruited in this study were 45 samples, 22 participants in the control group and 23 participants in the experimental group.

However, referred to the existing experimental design studies in Thailand regarding preschool-age children with ALL, the samples of existing researches were present as the detail by following:

The study of Saeui, Chintanadilok, Sriussadaporn, and Sanasuttipun (2009) whose conduct the quasi-experimental design with a pretest-posttest control group. They investigated the effects of an empowerment program on the competence of caregivers in Caring for Preschool Children with acute lymphoblastic leukemia undergoing chemotherapy. Samples contained 30 caregivers of children with acute leukemia, age 3-6 admitted for chemotherapy in Queen Sirikit National Institute of

Child Health (15 in the experimental group, and another 15 in the control group). The main results revealed that the mean scores of caregiver knowledge and caregiver's competence in the experimental group were statistically significantly higher than those in the control group.

Relevant to the quasi-experimental study to examine the effects of a teaching program on knowledge and behavior of caregivers to prevent infection in preschool-aged children with leukemia. The total sample was 32 sample, was divided into two groups: the experiment group (n = 16) receiving the infection prevention teaching program based on the learning theory of Gagné, Briggs, and Wager, and the control group (n = 16) receiving routine nursing care. The main finding that provides caregivers in the experimental group had a significantly higher knowledge score of infection prevention ($F = 71.29$, $p < .05$) and behavior score ($F = 37.31$, $p < .05$) than those in the control group. (Yooyen, Sanasuttipun, & Srichantaranit, 2019).

3. Sampling procedures

Convenience sampling was used to select participants following the inclusion criteria. Although the simple random assignment was planned to used, but owing to the outbreak of COVID-19 situation, the hospital policy guideline for reduce overcrowding of high risk patients were launched. The researcher needed to adjust the sampling procured from case random assignment to unit random assignment.

Whereas, the unit assignment risk to increase threat to internal validity, the researcher planned to control those threat by statistic consideration.

Researcher reviewed the medication record of pediatric patients with ALL based on inclusion criteria. When caregivers whose characteristics met the inclusion criteria were selected. Due to the outbreak situation, the hospital policy guideline for reduce overcrowding of high risk patients were launched. Phramongkutklao hospital's inpatient unit provided two wards for pediatric patient with malignancy Therefore, the preschool age children with ALL were assigned to admit in 2 units (for usual situation they have only 1 unit). This phenomenon effected to the assignment technique. The researcher revised the sampling technique from simple random technique with replacement to unit or ward assignment. The researcher used the two white sealed envelopes with mark the letter "E" for the experimental group and the letter "C" for the control group. And used another two pink sealed envelopes with mark the letter "Ward A" and the letter "Ward B". Whereupon, the research assistant random selected one white and one pink sealed envelopes. The result reveled ward B as experimental group and ward A as control group. The preschool age patients were assigned to admit by pediatrician regarding the condition of bed occupancy rate. Therefore, the caregivers of preschool age patient whose characteristics met the inclusion criteria and admitted at ward A were allocated in

control group. Another caregivers of preschool age patient whose characteristics met the inclusion criteria and admitted at ward A were allocated in experimental group

When the pediatrician ordered to admission, both two group are completely separate in each unit. This technique minimizes the contamination between those two groups. The sampling procedures outlined in Figure7

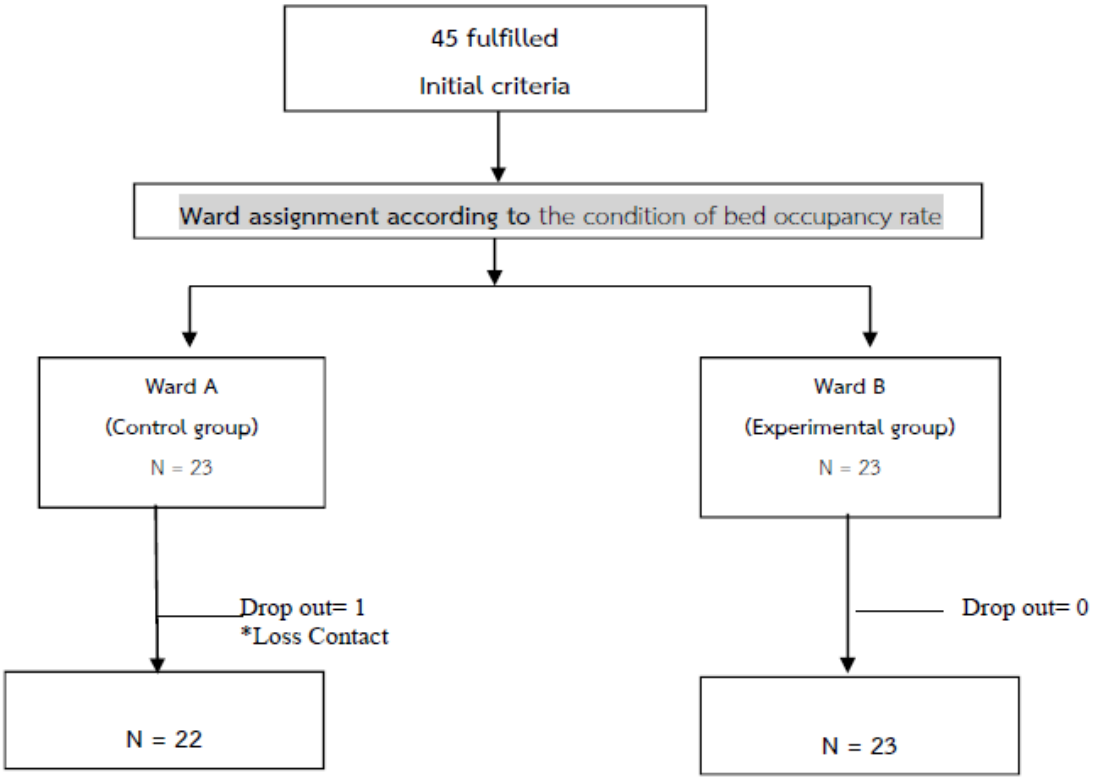


Figure 7 Details of the sampling procedure

Research instruments

The research instruments in this study comprised three types: (1) data collection instruments, (2) intervention instruments, and (3) instruments for validity check. The content validity of all instruments was reviewed by five experts including 1) a nurse instructor who was expert in pediatric hematology 2) a nurse instructor who was exert in the self-care deficit theory and pediatric malignancy; 3) a nurse instructor who was expert in pediatric chronic illness and pediatric malignancy; 4) a nurse instructor who was expert in the self-care deficit theory and pediatric malignancy; and 5) a nurse who was advanced practice nurse and expert in malignancy and chemotherapy treatment (Appendix D)

1. Data collection instrument:

The instruments for data collection was **"The personal information sheet and infection prevention behaviors questionnaires"** consisted of 3 parts: 1) Caregiver Information Sheet, 2) Pre-school age with ALL Information Sheet, 3) The infection prevention behaviors questionnaires (See Appendix F and G).

1.1 Caregiver Information Sheet was developed by the researcher and consisted of 9 items, requested participants to provide personal data: 1) age 2) marital status 3) role related to preschool age children 4) educational level 5) occupational 6)caregiver income 7)family income 8)History of obtaining information regarding infection prevention in children with ALL in the past 1 year 8) the resources of obtaining information.

1.2 Pre-school age with ALL Information Sheet was developed by the researcher consisted of 5 items, requested the data of pre-school age child: 1) age of preschool child; 2) gender of preschool child; 3) History of chemotherapy treatment 4) Past history of re-admission due to infection in past three month. 5) Rational for re-admission

1.3 The infection prevention behaviors questionnaires

The infection prevention behaviors questionnaires (IPBQ) which used in this study, the researcher modified from the original infection prevention behaviors questionnaire by Wichanan Jansong and Waraporn Chaiyawat(2016). The original IPBQ was developed base on the literature review of infection prevention behaviors aimed to measure infection prevention behaviors in mothers of 1-5 year-old children with cancer undergoing chemotherapy. The original IPBQ consist of 31 questions divided into 2 aspect, questions 1-6 are the aspect of drug administration and questions 7-31 are infection control aspects. The answers are check list do and not do (do = 1 point, not do = 0 point) as follows: 1) Do, meant mother perform behavior 2) Not do, it meant mother did not perform the behavior. The range of scores between 0-31, the more total scores represent the better infection prevention behaviors. The Content Validity Index: (CVI) was 0.80, internal consistency calculate by Cronbach's alpha coefficients was .78

For this study, the researcher modified the items according to the original one incomplete of some crucial infection control behaviors and did not cover the dimension of infection surveillance behavior. Based on specifics infection prevention behaviors are recommended by American Cancer Society (2013), Thai pediatric oncology group, (2016) and the literary review, the infection prevention behavior consist of medical administration, infection control and infection surveillance. The researcher modified the items by

1) Removed the 8th questionnaire. “I wash my hands with soap and water or using alcohol rub every time” and adjusted this item as the instruction for the next item “In questions 8 -14, the word "hand washing" refers to washing hands with soap and clean water or alcohol gel only”.
2) Added more items regarding low bacterial diet
3) Added more items to evaluate the infection control behavior.
4) Add more items to evaluate the infection surveillance.

Consequently, the modified IPBQ consist of 35 questionnaires, questions 1-7 are the dimension of medical administration, questions 8-31 are infection control dimension and questions 32-35 are the dimension of infection surveillance. The answers of instrument were check list: do and not do (do = 1 point, not do = 0 point), as follows: 1) Do, meant caregiver perform behavior every time 2) Not do, it means caregiver did not perform the behavior or they perform those behavior just

sometime. The total range of scores between 0-35, the more total scores represent the greater infection prevention behaviors

The data collection instrument all three parts were validated the by panel of 5 experts as mention above. Experts were asked to rate each items by rating scale (1 = not relevant to 4 = highly relevant), commented on items including possible revision, on their opinion why items are not relevant to the concept assertiveness. (Polit & Hunger, 2008). The content or the item were revised in the assumption of 3 of 5 experts indicated that content or items are not relevant to the concept.

Psychometric properties of this modified IPBQ were done with construct validity, content validity and internal consistency testing.

Construct Validity: The construct validity was determine by the known-groups technique. This type of construct validity demonstrated when the instrument can discriminate between a groups of individuals known to have a particular trait and a group who do not have the trait.(Brown, 2010; Davidson, 2014). The known group were 10 family caregivers of preschool-age children with malignancy undergoing maintenance phase of chemotherapy. By the reason of, the maintenance phase of chemotherapy is the last treatment phase, the patients whose go through this phase, it can be assumed that they were free from infection. And could be related to their caregivers have good infection prevention behaviors. Since comparable group were 10 family caregivers of preschool age with acute upper respiratory tract infection

(without malignancy undergoing chemotherapy). Family caregivers in this groups were assumed as achieving in lower scores of infection prevention behaviors. According to acute respiratory disease are the most common incident in preschool age children and the behavior to prevent infection really simple not strict as infection prevention behaviors for leukemic patients.

This type of construct validity measures an instrument's ability to distinguish among distinct groups. Group differences were determined using the nonparametric test (Mann-whitney U) of independence. Infection prevention behavior was the main construct. A hypotheses was identified a priori to determine known group validity was *the family caregivers of preschool-age children with malignancy undergoing maintenance phase of chemotherapy will have greater scores of infection prevention behaviors than the family caregiver of preschool-age children with acute upper respiratory tract infection.* The result revealed the median of infection prevention behavior scores of known group higher than the other one.

The results of the nonparametric test (Mann-whitney U) of independence to determine known group validity are presented in Table 2. Values with $p < .05$ were considered statistically significant. The hypotheses demonstrate high construct validity for modified IPBQ.

Table 3 The comparison of infection prevention behavior scores of infection prevention behavior between two group for construct validity testing

GROUP (n)	MEDIAN	SD	Mann-Whitney U value	Z	p-value
Family caregiver of children with malignancy (10)	32.7	1.05	.000	-.383	.000*
Family caregiver of children with Act. URI (10)	18.8	2.09			

*P<.05

Content Validity: Content Validity Index (CVI) was evaluated with the content validity index for items (I-CVI) and the content validity index for S-CVI/Ave through the opinion of the content experts. The modified version were discussed by the previous 5 committees. Based on the feedback from the experts, each item high relevance to the concept as result quantified the acceptable value with the I-CVI 1.0. Regard to S-CVI (Average), with the score 1.0, it indicates the appropriateness of the scale.

Reliability: The internal consistency of this instrument was tested with 30 caregivers of preschool age children with any kind of malignancy undergoing chemotherapy by using the cronbach's alpha coefficients was 0.78. For the main study the reliability was 0.73.

2. Intervention instrument

It included conventional care and the program promoting infection prevention behavior as following

2.1 The conventional care: the pediatric patient with ALL and caregiver received health education regarding infection prevention behaviors (bed side teaching) individually by nurses. Those health education was inform when the first day of admission at the same time of hospital orientation. And when the patient was allowed to discharge, the nurse will attribute caring manual for guidance caring at home.

2.2 The program promoting infection prevention behavior (PPIPB):

It is a nursing intervention for supporting participant to develop their infection prevention behaviors for preschool-age children with ALL. Emphasized in infection prevention behaviors agency based on Orem's Self-Care Deficit Theory (Orem, 2001) and the content based on infection prevention behaviors in pediatric cancer guideline (American Cancer Society, 2013. And Thai pediatric oncology group, 2016) and intensive literature reviews.

The nursing intervention in the program provided the method of guiding, teaching, coaching and supporting-providing the developmental environment. All those intervention intervened four necessary power components of infection prevention behavior agency including, enhance ability to acquire technical

knowledge regarding infection prevention behavior, enhance ability to make decisions regarding infection prevention behavior, enhance ability to perform infection prevention behavior, enhance motivation to perform infection prevention behavior.

The researcher described the PPIPB: in three topics (1) the program development, (2) the program trial, and (3) the program modification as follow:

(1) The program development

The PPIPB was developed based on the concept of dependent care agency in Self Care deficit Theory (Orem, 2001). The content based on infection prevention behaviors in pediatric cancer guideline by American Cancer Society (2013) and Thai pediatric oncology group (2016) and intensive review. The model was use for developing nursing interventions developed by the Nursing Science Department at Utrecht University (Gamel, Grypdonck, Hengeveld & Davis, 2001). The model consists of four stages: (1) problem definition (2) accumulation of building blocks for intervention design, (3) intervention design and (4) intervention validation, as described in the Chapter2.

The program promoting infection prevention behavior was developed within the specific goals of enhancing infection prevention behavior agency through the nursing intervention. By intervene the crucial 4 power components of infection prevention behavior agency, consist of, ability to acquire technical knowledge, ability

to make decision about care, ability to perform care and motivation. Those nursing interventions manipulate all 4 significant power components by used the method of guiding, teaching, coaching and providing the developmental environment. It presumed that family caregivers of pre-school age children with ALL who receive the PPIPB would have greater infection prevention behavior than those who receive conventional care. Besides, the family caregivers would have greater infection prevention behavior than before participation in the program.

Program instructional media

- The booklet for family caregivers: An education manual regarding infection prevention behaviors which consists of content were as, knowledge of disease, treatment, benefits of infection prevention behaviors and the detail related to infection prevention behaviors (medication administration, infection control, and infection surveillance). Including hand washing and facial mask used guidance.

- Video Clip Scenario “Which one what would you choose”: The video scenario of common situations that always occurred and have difficulty deciding practice behavior.

This scenario was provided within the supervision of researcher. There are 7 simulation situations consist of: medication administration problem, making decision in wearing face mask, children denial of oral care, making decision in hand washing, making decision in selecting appropriate diet, making decision in allowing children to

crowed place, and dealing with children with high grade fever. Total time of scenario was 20 minutes.

- Caregiver's memo booklet: A notebook for recording problems and limitations that arise in performing infection prevention behavior at home.

(2) The program trial phase

The program promoting infection prevention behavior (PPIPB) *validation*

The researcher developed the program by the application of Orem Self-care deficit nursing theory with consultant of major advisor. The program was validate by a panel of five experts. Experts were asked commented on the construct and content including possible revision, the content were revised in the assumption of 3 of 5 experts indicated that content or construct are not relevant to the program or inappropriate to deliver. There are no issue of major revision regarding the construct or the content of program.

The instructional media validation

- The booklet for family caregivers, the story board of video clip scenario and caregiver's memo booklet were validated by the same panel of expert. The revision were occurred in the assumption of 3 of 5 experts indicated that those media need to be adjusted. The 3 experts commented regarding the text size of the booklet for family caregivers were too small, the text font were difficult to read and some

pictures were not related to the contents. Therefore, the researcher revised the booklet for family caregivers according to the suggestion of the expert.

Because the feasibility of the program is important, a pilot study was conducted on 10 family caregivers who had similar characteristics to the participants in the study. The objectives for conducting the field testing were to: determine the feasibility and identify the problems with implementation of the PPIPB. The results indicated that the time of each session might be varied due to individual need of caregivers. Therefore, the researcher adjusted the time to provided flexible interval period. The revision based on Self-care deficit theory. The theory focuses on a person has achieved in their agency regarding behavior, if the person consummate enough ability they can develop or change their behavior without specify time frame for behavior development. (Orem, 2001). Finally, the PPIPB was found to be appropriate for all family caregivers of preschool age children with ALL.

(3) The program modification

Owing to the hospital policy changes during outbreak situation, those effected to the protocol of treatment. The chemotherapy treatment guideline was revised regarding decrease of the patient's length of stay. In spite of that, the revision of the program promoting infection prevention behavior for a protocol amendment were occurred. According to suggestions from the experts and possibility to conduct the research and accordance with the situation. The researcher had to modify the

intervention under the suggestion of the advisors and under the conditions of IRBRTA still based on SCDT. In keeping with SCDT, Orem did not mention specify time frame for behavior development. The theory focused on a person has achieved in DCA, they can develop DC, thus relying on empirical data. From existing research studies within the theoretical framework of SCDT, it was found the information regarding duration time of nursing activities to promote the dependent care agency with statistically significant increase in dependent care. The duration of the study was from 2 days to 4 weeks, with the number of meeting visits between 2 to 8 sessions of 10-60 minutes per visited, depending on the activity. The variation of time was largely dependent on the frequency visit and also, depending on the intensity of nursing activity. Therefore, the nursing activities modification of the program specified the number of periods and the number of visits with consideration of

1. Length of pediatric patients to be hospitalized
2. The activity must be completed before the patient discharge. Because the researcher need to evaluate the results of the activities for the caregivers to perform infection prevention behavior at home.
3. Caregivers must be consistent in receiving nursing activities or teaching repeatedly and practicing until becoming proficient

The researcher adjusted the program based on the original construct and objective of program with the consultant and agreement of thesis advisor. According

to SCDT, Orem did not mention specify time frame for behavior development. The theory focused on a person has achieved in DCA, they can develop DC, thus relying on empirical data. From existing research studies within the theoretical framework, it was found the information regarding duration time of nursing activities to promote the dependent care agency with statistically significant increase independent care. The duration of the study was from 2 days to 4 weeks, with the number of visiting between 2 to 8 sessions of 10-60 minutes per visit, depending on the activity. The variation of time was largely dependent on the frequency visit and also, depending on the intensity of nursing activity.

1. The researcher adjusted the program by shortening the distance between each meeting, and increased the duration period of intervention for longer. In order to comply with the patient's the shorter length of stay in hospital. However, the content and the number of intervention session still remained as the original approved version.
2. Adjusted the format of the instructional media to electronics form
3. Followed the preventive guideline for situation of the outbreak.

Consequently, the program was revised by shortening the distance between session, and extent the duration period of intervention. In order to comply with the patient's the shorter length of stay in hospital. However, the content and the number of intervention session still remained as the original approved version. Moreover, the

instructional media format were adjusted to electronics form. The program was tried-out on 4 family caregivers of preschool age children with ALL who had similar characteristics to the participants in the study. The purpose for conducting the pilot study were (1) to determine the feasibility of the intervention, (2) to identify problems of an experimental intervention. The results of try-out indicated that the intervention feasibility to delivery.

The program included 5 sessions of face to face approach at IPD and 1 telephone visit, the total intervention time was 8 days

Session 1: (1st date of admission) 30 minutes

Session 2: (2nd date of admission) 70 minutes (1st part= 30 minutes/ 2nd part = 40 minutes)

Session 3: (3th date of admission) 30 minutes

Session 4: (4th date of admission) 30 minutes

Session 5: (Last date of admission) 40 minutes.

Telephone visit (3 days after discharge) 15 minutes.

Table 4 The summarization of the intervention process

Session	Nursing activities:	Time	Media
Session 1: First meeting 1st date admission	1The researcher and participant discussed and analyzed the ability and limitation to behave infection prevention behavior. 2.The researcher encouraged the participant to establish the specific short and long term goal for achieving perform infection prevention behavior	30 minute	Caregiver's memo booklet
Session2: Second meeting 2nd date of admission 2 parts of activities Part 1: Personal guiding Part 2: Personal coaching	1. The researcher use teaching method by providing teach-back technique for personal guiding in topic of "Infection Prevention Behaviors in children with ALL" 2. The researcher demonstration and return demonstration the crucial skill of infection prevention: drug administration, hand washing, facial mask using, and children's oral hygiene care.	30 minute 40 minute	-The booklet for family caregivers
Session 3: Third meeting 3rd date of admission	1. Simulation teaching. The researcher provided VDO clip scenario "Which one what would you choose". After watching clip scenario, the participant will be encourage to make decision in those situation. The researcher will convince the participants to discuss alternative situation, provide the reasons for those decision and how to overcoming or compensation for limitations Reviewed all significant content /discussed to supply and regulate essential environment by encourage the participant to evaluate the limitation that may arise when returning home and plan the solution to manage	30 minute	Scenario Video Clip
Session4: Fourth meeting		30 minute	-The booklet for

Session	Nursing activities:	Time	Media
4th date of admission	housewares environment for promoting infection prevention behavior / Infection prevention behavior planning 1. The researcher review all content by discussing capability and limitation of the caregiver. Motivation and empowerment for those improvement behavior. Adjust or provide beneficial information for inappropriate behavior. 2 Evaluation of infection prevention behavior plan 3. Assess the ability to practice preventive behavior and provide additional suggestions for incomplete sections 4. Summary of care plans for prevention infections at home 5. Guiding communication methods in case caregivers need additional advice		family caregivers
Session5: Fifth meeting on the last date of admission		40 minute	The booklet for family caregivers

3. The instruments for validity check

The instruments for monitoring the intervention in this study was the infection prevention behavior agency visual analogue scale consist of 3 parts

3.1 The ability to acquire knowledge regarding to infection prevention visual analogue scale

3.2 The ability to make judgment regarding to infection prevention visual analogue scale

3.3 The ability to perform infection prevention behavior visual analogue scale

The instruments was developed by the researcher underneath the concept of dependent care operation. (Orem2001) and supported by trustworthiness evidences. The instrument was applied three dependent care operation, were as estimative, transitional, and productive operation. The estimative operations involve acquiring knowledge and analyzing information. For the transitional operations are those in which decision-making and determining a course of action occur. Finally, in the productive operations refers to action is taken and adjusted based on an evaluation of outcomes (Dennis, 1997; Orem, 2001)

The instrument are Visual Analog Scale (VAS) on a horizontal straight line with a length of 100 millimeters instead of continuous numbers, without showing numbers. The caregiver marked on a horizontal straight line that represents their own ability level. From the lowest level of ability at the far left position to the highest level of ability at the far right. Calculate points for all items combined the range of the scores is between 0-100. The level for passing was established at 90% of total score. The higher score meant the participants have more infection prevention behavior agency than lower score. The caregivers must have an average score of the ability to acquire knowledge, the ability to make judgment and the ability to perform behavior more than 90%, considered qualified to meet the criteria of the

experiment. If any participant could not meet the criterion level, they were allowed to ask and review their agency again until they well understood.

The instruments for validity check was validate content validity by a panel of five experts. The recommendations were that the use of confusing sentences and negative questions should be reconsidered. The content validity index (CVI) of instruments were as follow

-The ability to acquire knowledge regarding to infection prevention visual analogue scale I-CVI= 0.8-1, S-CVI (AVE) = 0.96

-The ability to make judgment regarding to infection prevention visual analogue scale I-CVI of all items were 1, S-CVI (AVE) = 1

- The ability to perform infection prevention behavior visual analogue scale I-CVI of all items were 1, S-CVI (AVE) = 1

For reliability testing, the researcher submitted the instruments for validity check to trial use with 30 caregivers and calculated Cronbach's alpha coefficient were as follow:

- The ability to acquire knowledge regarding to infection prevention visual analogue scale = .836

- The ability to make judgment regarding to infection prevention visual analogue scale =.892

- The ability to perform infection prevention behavior visual analogue scale = .926

Infection prevention agency of family caregiver in preschool age children with ALL was evaluated by the validity check instrument: The infection prevention behavior agency VAS. Those instrument was administered in the experimental group only, aimed to monitoring the experimental and evaluated the dependent-care agency of caregivers. The test was determined two times at the first and the fifth meeting, the level for passing which recommended by the experts was established at 90% of the score for each aspect.

For the baseline scores of Infection prevention behaviors agency in three aspects. The finding revealed almost participants could not meet the criterion level at 90%. For ability to acquired knowledge, there were 4 participants or 17.39% who met the scores over than 90%. Six participants (26.09%) met the criterion level for the baseline scores regarding ability to make judgment. And none of the participants met the criterion level of ability to perform behaviors. The researcher employed this set of data as a basis and guidance for behavioral modification.

Participant who could not reach this criteria, they were allowed to ask and review their agency again until they well understood. This process performed until the participants understood and reached the criterion of test. Finally, all participants in the experimental group met the criterion of test. The results showed the mean

score of the participants in the experimental group was 94.12%, the score of three aspect were:

- The ability to acquire knowledge regarding to infection prevention visual analogue scale = 94.01 %

- The ability to make judgment regarding to infection prevention visual analogue scale = 94.83%

- The ability to perform infection prevention behavior visual analogue scale = 93.68%

Experimental Procedure

This section was divided into 3 phases including preparation, implementation, and evaluation. Details of these procedures are described below:

1. Preparation Phase

1.1 Instrument preparation: The manual of the PPIPB, materials for this program, and an instrument were developed by the researcher and with content validity established by five experts.

1.2 Researcher preparation: The researcher served as an informant, consultant, and facilitator for this study.

1.3 Research assistant preparation*:* To this study, there was a research assistant from Phramongkutklao Hospital. She is a nurse specialist at the pediatric hematologic unit. While performing the research assistant's role, she was not on duties. The

researcher explained the procedure of research and clarified the data collection procedures. The role of research assistants included assisted in data collecting the questionnaires of pre and post experiment and also the validity check instruments.

1.4 Field research preparation: The researcher informed the director of hospital, and collaborated with the staff nurses of pediatric IPD unit. The objectives, procedures, and the approximate length of time for data collection were described.

2. Implementation phase

2.1 Procedures in the control group

The participants in the control group received the conventional care during being visit at pediatric in-patient department. The participants received information related to infection prevention for pediatric cancer patient. These health information provided by nurses, inform when the first day of admission at the same time of hospital orientation. And when the patient was allowed to discharge, the nurse attribute caring manual for caring guidance. The follow up occurred 1 weeks after discharge, the research assistant asked participate to do the posttest.

2.2 Procedures in the experimental group:

The participants in the experimental group received the program promoting infection prevention behavior consists of strategies to promote dependent care agency. The protocol of the program was individual approach including 5 sessions. The total intervention time was 5 days, by researcher met family caregivers at the IPD and practiced following program at home. The details are described as follows:

Session 1:

First meeting on first date admission at pediatric IPD, (30 minutes)

Objective: Having motivation to perform dependent care

Specific objective

1. Caregivers able to identify own ability and limitation to perform infection prevention behavior
2. Caregivers able to establish the goal of care according to infection prevention Behaviors.

Nursing activities: The participant will be discussed the participant's experience regarding infection prevention behavior regarding to assess knowledge, skill and attitude regarding infection prevention behaviors. Moreover, researcher will encourage the participant to evaluate own ability and limitation to behave infection prevention behavior by asking the information. In addition, the researcher will use guiding method by providing information relevant to the dependent care demand according to infection prevention in children with ALL. After that, the researcher will empower the participant to establish the specific short and long term goal for achieving to perform infection prevention behavior, and make appointment with the participants which tomorrow is the time for 2nd meeting.

Session 2

Second meeting on the second date of admission at pediatric IPD

Objective of meeting: *To promote all 3 dependent care operations.*

Specific objective

1. Caregivers perceive benefit of infection Prevention Behaviors.
2. Caregivers knowledgeable about Infection Prevention Behaviors
3. Caregivers have repertoire of skill in infection prevention behaviors.

Nursing activities: During 2nd meeting, there are 2 parts of activities

Part1: **Personal guiding** (30 minutes). The researcher will use teaching method by providing teach-back technique for personal health education in topic of "Infection Prevention Behaviors in children with ALL". The content of the information consist of short briefing about disease's pathology, knowledge about infection in acute lymphoblastic leukemia, infection prevention behavior protocol and benefit, repertoire of skill in infection prevention behavior (drug administration, hand washing, facial mask using, keep patient good oral hygiene, stickily aseptic technique, prepared clean food and drink).

Part2**: Personal coaching** (40 minutes).The researcher will demonstration and return demonstration the crucial skill of infection prevention: drug administration, hand washing, facial mask using, and children's oral hygiene care.

Session 3

Third meeting on the second week of admission at pediatric IPD (30 minutes)

Objective of meeting: *To promote all 3 dependent care operations.*

- Having motivation to perform dependent care

- Ability to make decisions about dependent care
- Ability to acquire technical knowledge about dependent care
- Ability to perform dependent care.

Specific objective Caregivers improve ability to make decision in performing infection prevention behaviors.

Nursing activities:

Simulation teaching. The researcher provided VDO clip scenario “Which one what would you choose”. After watching clip scenario, the participant will be encourage to make decision in those situation. The researcher will convince the participants to discuss alternative situation, provide the reasons for those decision and how to overcoming or compensation for limitations

Session4

Fourth meeting on the fifth day of admission at pediatric IPD (30Minutes)

Objective of meeting: To promote all 3 dependent care operations.

- Having motivation to perform dependent care
- Ability to make decisions about dependent care
- Ability to acquire technical knowledge about dependent care
- Ability to perform dependent care.

Specific objective : Caregivers able to overcome or compensate for limitations to perform infection prevention behavior at home

1. Content reviewing
2. Infection prevention behavior planning

Nursing activities

- The researcher reviewed all significant content
- The researcher discussed the participant to supply and regulate essential environment by encourage the participant to evaluate the limitation that may arise when returning home and plan the solution to manage housewares environment for promoting infection prevention behavior
- Infection prevention behavior planning

Session5

Fifth meeting on the last date of admission at pediatric IPD (40minutes)

Objective of meeting: To promote all 3 dependent care operations.

- Having motivation to perform dependent care
- Ability to make decisions about dependent care
- Ability to acquire technical knowledge about dependent care
- Ability to perform dependent care.
- Validity check

Nursing activities

1. The researcher review all content by discussing capability and limitation of the caregiver. Motivation and empowerment for those improvement behavior. Adjust or provide beneficial information for inappropriate behavior.
2. Validity check
3. Evaluation of infection prevention behavior plan
4. Assess the ability to practice preventive behavior and provide additional suggestions for incomplete sections
5. Summary of care plans for prevention infections at home
6. Guiding communication methods in case caregivers need additional advice

Data collection procedure

Data only will be collected after obtaining approval from the Institutional Review Board (IRB). The following describes the data collection procedures for this study: The procedures of data collection were as follows:

1. After the study was approved by the institution review board of Royal Thai Army Medical Department (IRBRTA) (Appendix I), the researcher informed the director of pediatric inpatient unit, explained the study propose and procedure, the beginning of the study and the approximately length of data collection.

2. The researcher recruited the participant according to the inclusion criteria in this study. When participant who met inclusion criteria visited at pediatric inpatient unit (unit randomly assignment) researcher approached and explained objectives,

procedures, and the protection of human right for participants. When they decided to participate in study, the consent form was signed

3. The research assistant conducted the pretest by asking the participants in both group to answer the IPBQ and infection prevention behavior visual analogue scale for experimental group

4. The researcher explained the participants about which group they would be in the control or the experimental group.

5. The participants in the control group received the conventional care, while participants in the experimental group received the program promoting infection prevention behavior.

6. Monitoring the intervention by

6.1 The research assistant conducted the validity check instrument (infection prevention behavior visual analogue scale) for experimental group.

6.2 The participant whose could not meet the criterion level, they were to review their agency and discussed with the researcher. There were 3 participants could not meet the criterion level of ability to make judgment. The researcher approached them individually, assessment and complement the program until the participants understood and achieved those ability within the supervision of researcher.

7. The obtaining data for posttest conducted at the follow up visit (after the patient discharge for 1 week) by the research assistant.

8. The research checked the correct data and cleaned the data before to data analysis.

Protection of the human rights subjects

The authorization for conducting human subject research was obtained from the institution review board of Royal Thai Army Medical Department (IRBRTA), certificate No.Q012q/63. When the family caregivers who met the specified criterion, the researcher asked permission for collecting the data was obtained from the participants. The inform consent form explains the purposes of the study, benefits, risks, and the types of questionnaires to be completed. The participants was informed also about their rights to refuse participation. If the participants do not want to participate, they can withdraw from the study at any time without penalty. Their name will not be addressed in the data; a code number will be used to ensure confidentiality. This intervention presented no harm at all to the participants, and did not interrupt with the routine nursing care or medical care. There is neither cost nor any payment to participate in this study.

Data Analysis

Data analysis includes the application of descriptive and inferential statistics. Descriptive statistics was applied to delineate the characteristics of the sample, and examine the distribution of demographic variables and the variables of interest in this study using the Statistical Package of the Social Science for Personal Computer (SPSS/PC). The significant level of statistical test is set up at .05. The processes of data analysis are as follows:

Part 1: General information for the sample group was analyzed by use descriptive statistics and analysis of the differences in the general information between the control and experimental groups by use of chi-square.

Part 2: The result of hypothesis testing: The analysis of the differences between the infection prevention behaviors difference scores obtained by using the infection prevention behaviors questionnaire in the control and experimental groups was performed by using independent t-test performed statistical analysis by designating statistical significance at .05

Part 3: Infection prevention behaviors agency

Part 4: The qualitative data PPIPB experiences in experimental group

CHAPTER IV
RESEARCH RESULT

The purpose of this study to compare infection prevention behaviors among family caregivers of pre-school age children with acute lymphoblastic leukemia between the control group and the experimental group. The sample was composed of 45 family caregivers of pre-school age children with acute lymphoblastic leukemia who were admitted in pediatric IPD, Phramongkutklao Hospital. The family caregiver whose characteristic met the inclusion criteria were included to the study. 23 were randomly assigned into the control group and 23 caregivers in the experimental group. During the study one caregiver in the control group dropped out because failed to maintain follow up for post evaluation. Thus, the numbers of caregivers in control group were 22. Family caregivers in the experimental group participated in program promoting infection prevention behaviors whereas patients in the control group received the conventional nursing care from nurses. The participants in the control group received the conventional care during being visit at pediatric in-patient department. For the participants in the experimental group received the program promoting infection prevention behavior. The program was individual approach including 5 sessions, total intervention time was 5 days, by researcher met family caregivers at the IPD and practiced following program at home. Data were collected twice: the recruit date and 12th days after recruitment by research assistant. The instruments for data collection was “The personal information sheet and infection prevention behaviors questionnaires” consisted of 3 parts: 1)

Caregiver Information Sheet, 2) Pre-school age with ALL Information Sheet, 3) The infection prevention behaviors questionnaires.

Data analysis includes the application of descriptive and inferential statistics. Descriptive statistics was applied to delineate the characteristics of the sample, and examine the distribution of demographic variables and the variables of interest in this study using the Statistical Package of the Social Science for Personal Computer (SPSS/PC). The significant level of statistical test is set up at .05. The processes of data analysis are as follows:

Part 1: General information for the sample group was analyzed by use descriptive statistics and analysis of the differences in the general information between the control and experimental groups by use of chi-square.

Part 2: The result of hypothesis testing

Part 3: Infection prevention behaviors agency

Part 4: The qualitative data PPIPB experiences in experimental group

Part 1 General information for the sample group was analyzed by use descriptive statistics and analysis of the differences in the general information between the control and experimental groups by use of chi-square.

Table 5 Demographic characteristic of the participants

Characteristics	Control	Experimental	Total	X^2 (df)	p - value
	n =22	n =23	n=45		
	n (%)	n (%)	n (%)		
Gender				0.34(1)	.56
Male	5 (22.73)	7 (30.43)	12 (26.67)		
Female	17 (77.27)	16 (69.57)	33 (73.33)		
AGE				18.6(12)	.10
18-29	6 (27.27)	3 (13.04)	9 (20.00)		
30-39	8 (36.36)	7 (30.43)	15 (33.33)		
40-49	5 (22.73)	9 (39.13)	14 (31.11)		
50-59	3 (13.64)	3 (13.04)	6 (13.33)		
60		1 (4.35)	1 (2.22)		
Average age (Year)	38.27	40.69	39.48		
Marital Status				1.34(3)	.72
With spouse	18 (81.82)	19 (82.61)	37 (82.22)		
Without spouse	4 (18.18)	4 (17.39)	8 (17.78)		
Education Level				1.31(3)	.73
Elementary	4 (18.18)	4 (17.39)	8 (17.18)		
High school	5 (22.73)	7 (30.43)	12 (26.67)		
Bachelor	12 (54.55)	12 (52.17)	24 (53.33)		
Post-Graduation	1 (4.55)	-	1 (2.22)		
Occupation				.34(3)	.94
Government official	3 (13.64)	3 (13.04)	6 (13.33)		
Private Office staff	7 (31.82)	6 (26.09)	13 (28.29)		
General Employee	7 (31.82)	7 (30.43)	14 (31.11)		
Other	5 (22.73)	7 (30.43)	12 (26.27)		
Family Income				2.25(2)	.32
10,000 – 20,000	2 (9.09)	6 (26.09)	8 (17.78)		
30,000 – 50,000	10 (45.45)	8 (34.78)	18 (40.00)		
50,000 UP	10 (45.45)	9 (39.13)	19 (42.22)		

Table 5: Demographic characteristic of the participant (cont.)

Characteristics	Control	Experimental	Total	X^2 *(df)*	*p- value*
	n =22	**n =23**	n =45		
	n (%)	**n (%)**	n (%)		
Relation status				1.31 (4)	.86
Father	5 (22.73)	7 (30.43)	12 (26.67)		
Mother	12 (54.55)	12 (52.17)	24 (53.33)		
Other relative	5 (22.73)	4 (17.39)	9 (20.00)		
Hx receiving information				1.20(1)	.27
Yes	15 (68.18)	12 (52.17)	27 (60.00)		
No	7 (31.82)	11 (47.83)	18 (40.00)		

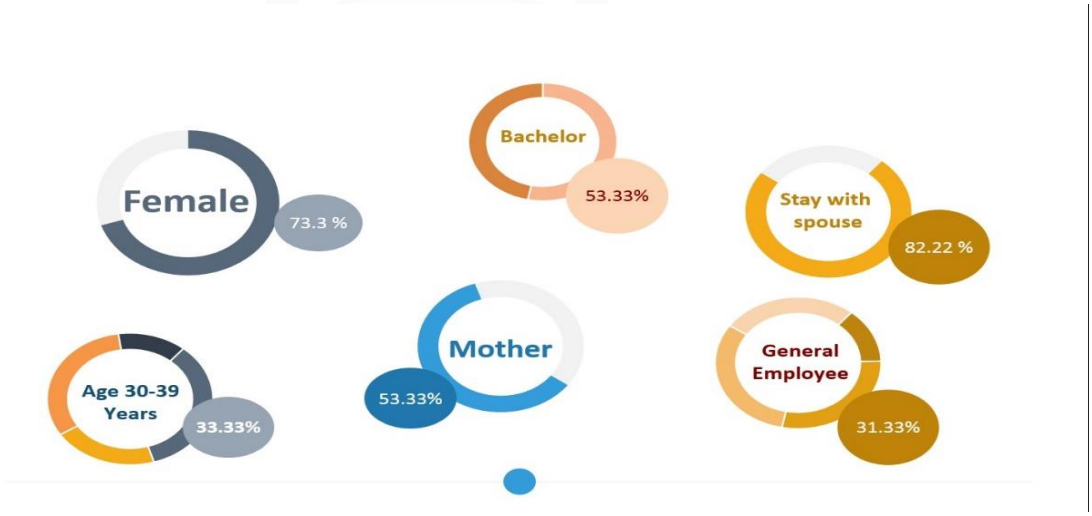


Figure 8 Demographic characteristic of the participants

From table 5 revealed the characteristics of the control group and the experimental group. Most of the samples in this study were females (73.33%), mostly were mother (53.33%) who stayed with spouse (82.22 %). The average age of participant was 39.48 years, mostly were in the age groups of 30-39 years (33.33%). The family income of participant were 50,000 baht and over, 53.33% of them graduated in bachelor level and earning as general employee (31.11%). Sixty percent of participant reported the history of receiving infection prevention information from variety recourses.

Table 6 Demographic characteristic of preschool age children with ALL

Characteristics	Control	Experimental	Total	X^2 *(df)*	*P- value*
	N=22	N=23	N=45		
	N (%)	N (%)	N (%)		
Mean of age	4.32	4.61	4.47	.20(1)	.66
Gender					
Boy	11 (50.00)	13 (56.52)	24 (53.33)		
Girl	11 (50.00)	10 (43.48)	21 (46.67)		
Past history of re-admission within 3 months				.24(1)	.63
Yes	7 (31.82)	10 (43.48)	17 (37.78)		
No	15 (68.18)	13 (56.52)	28 (62.22)		

From table 6, revealed the characteristics of preschool age children with ALL in the control group and the experimental group. In the control group half of the patients were boys and the other half were girl. The 31.82 % of preschool age children in control group had been re-admitted due to infection causes within 3 months before were recruited. For the experimental group, 56.52 % were girls and 43.48 % were girls. The preschool age children in the experimental group had past history of re-admitted due to infection causes within 3 months 43.48%.

The chi-square was performed for investigate the different of characteristic between both groups. The result revealed no statistically significant difference between the control and the experimental group regarding gender, marital status, education level, occupation, and relation status. For demographic characteristic of preschool age children with ALL the result also revealed no statistically significant difference between the control and the experimental group regarding gender of preschool age children and past history of re-admission due to infection in three month. Thus, it could be assumed both groups were similar demographic characteristics.

Table 7 Mean and standard deviation of pretest scores, posttest scores and differences scores of IPBQ.

Infection prevention behavior	Pretest	Posttest	Difference Score
	MEAN(SD)	MEAN(SD)	MEAN(SD)
Control (N=22)			
Total scores	28.27(3.79)	28.90(3.98)	0.64(0.73)
- medical administration (7)	6.36(0.73)	6.36(0.66)	0.00 (0.53)
- infection control (24)	19.09(3.24)	19.68(2.92)	0.59(0.59)
- infection surveillance (4)	2.81(0.80)	2.86(0.71)	0.04(0.48)
Experimental (N=23)			
Total scores	28.96(4.23)	33.74(1.32)	4.78(3.93)
- medical administration (7)	6.30(0.97)	7.00(0)	0.70(0.97)
- infection control (24)	19.87(2.82)	23.22(0.80)	3.35(2.52)
- infection surveillance (4)	2.79(0.85)	3.53(0.73)	0.74(1.01)

Table 7 illustrated the mean scores and standard deviation of pretest scores, posttest scores and differences score of three dimension in IPBQ. The total score consist of medical administration 7 scores, infection control 24 scores and infection surveillance 4 scores.

Part 2 The result of hypothesis testing

Hypothesis: The family caregivers in the experimental group have higher difference scores (d) of infection prevention behaviors than the family caregivers in the control group. To answer hypothesis, independent t-test was performed. Independent t-test is used to test between-groups differences, when the samples differ with respect to other extraneous variables. Means and distributions underlying the independent t-test:

The three assumptions underlying independent t-test were not violated. (APPENDIX M) Independent t-test was used to compare difference scores of infection prevention behaviors between the experimental group and control group. The table 10 revealed that the mean score of alcohol consumption between 2 groups at pretest was not significant difference at pretest and at posttest was statistically difference at the level of .05.

Table 8 The comparison of difference scores of infection prevention behavior between control group and experimental group.

Infection prevention behaviors	n	Difference Score MEAN	SD	t	df	*p*-value
Total IPBQ score				-4.87	43	.00*
Control group	22	0.64	0.73			
Experimental group	23	4.78	3.93			
Medical administration						
Control group	22	0.00	0.53	-2.95	43	.00*
Experimental group	23	0.70	0.97			
Infection control						
Control group	22	0.59	0.59	-5.01	43	.00*
Experimental group	23	3.35	2.52			
Infection surveillance						
Control group	22	0.46	0.49	-2.926	43	.00*
Experimental group	23	0.74	1.01			

***(p < .05)**

For the hypothesis testing of the difference score between control group and experimental group was done by the independent t- test. The result rejected the null hypothesis of the difference scores between control and experimental group, were significantly different at the statistical level of .05.

The result illustrated that the mean of difference scores of infection prevention behavior in the experimental group (Mean=4.78, SD=3.93) had higher than

that in control group (Mean=0.64, SD=0.73). Thus, the family caregivers who received the program promoting infection prevention behavior achieve the difference scores (d) of infection prevention behaviors higher than the family caregivers who's received the conventional nursing care. Moreover, considering of mean of difference scores in sub dimension, the finding yielded significantly different at the statistical level of .05. All three dimensions of infection prevention behaviors in the experimental group had higher scores than that of the control group after receiving intervention as well.

Part 3 Infection prevention behaviors agency

Table 9 Descriptive analysis of infection prevention behavior agency percentage in experimental group.

infection prevention behavior agency	**Pre-intervention (%)**				**Post-intervention (%)**			
	MEAN	**SD**	**Max**	**MIN**	**MEAN**	**SD**	**Max**	**MIN**
Ability to acquire knowledge	86.02	4.82	91.07	70.00	94.01	1.30	96.79	92.50
Ability to make judgment	86.03	4.84	94.83	73.13	94.83	3.50	97.50	86.25
Ability to perform behavior	80.64	4.91	87.50	69.50	93.68	1.51	96.50	92.00
Infection prevention behavior agency	84.34	4.10	89.38	70.63	94.12	1.41	96.72	90.94

From table 9 presented the mean scores, standard deviation, minimumscores and maximum scores of infection prevention behavior agency. The caregivers must have an average post-intervention scores of the ability to acquire knowledge, the

ability to make judgment and the ability to perform behavior more than 90%, considered qualified to meet the criteria of the experiment.

Finally, all participants in the experimental group met the criterion of test. The results showed the mean score of the participants in the experimental group was 94.12%, the score of three aspect were:

- The ability to acquire knowledge regarding to infection prevention visual analogue scale = 94.01 %

- The ability to make judgment regarding to infection prevention visual analogue scale = 94.83%

- The ability to perform infection prevention behavior visual analogue scale = 93.68%

Table 10 Comparison of pre-intervention and post- intervention agency percentage among family caregivers in experimental group.

Infection prevention behavior agency	**Pre-intervention (%)** Mean (SD)	**Post-intervention (%)** Mean (SD)	**df**	**t**	***p*-value**
Ability to acquire knowledge	86.02 (4.82)	94.01 (1.30)	22	-8.17	0.00*
Ability to make judgment	86.03 (4.84)	94.83 (3.50)	22	-6.95	0.00*
Ability to perform behavior	80.64 (4.91)	93.68 (1.51)	22	-13.12	0.00*
Infection prevention behavior agency	84.34 (4.86)	94.12 (2.11)	22	-9.41	0.00*

***(p < .05)**

From table 10 revealed that infection prevention behavior agency percentage in the experimental group had statistical difference between pre-intervention and post intervention in all three aspect at the level .05.

Part 4 The qualitative data PPIPB experiences in experimental group

This session focuses on the family caregiver' experiences of receiving PPIPB, as it not only presents a behaviors modulation to prevent infection for their child but also a personal encounter involving their satisfaction of receiving a special nursing care. The findings under three categories showed how family caregivers of pre-school age children with ALL felt after the intervention. They included, be confidence in seeking information, be confidence in making decisions and dealing with unexpected situation and being a significant agent. Moreover, majority of participants stated that they would perform appropriate infection prevention behavior and willing to support children for any possible ways that made children go home less complications and less suffering from the treatment.

There were clear examples of how participants had benefited from the program (The codes by the end of each sentence referred to the age and gender of family caregivers)

Be confidence in seeking information

The participant reported they gained more confidences to finding the knowledge of the infection prevention behavior, even in case of elderly caregiver. The caregivers had discretion in selecting reliable information, Moreover, some participants learned to gain their knowledge

"*I have more confident in seeking knowledge or ask the questions to the healthcare personals, because all the time I was not keen to ask my doctor or nurse for information regarding caring my child". (F,56) and (F,60)*

"I love looking for information on the internet but in the past I didn't know what kind of information would be reliable. After this program, I know how to access for credible information. I am more careful in believing the information from internet or any kind of sources" (M, 42) and (F, 28)

"I extend my knowledge regarding how to finding the source of information and whom to consult" (M, 44)

"I discussed with other caregivers, some of them provided interesting information. In case of those information made me curious, I had been confirmed with doctor or nurses. (M, 31)

Be confidence in making decisions and dealing with unexpected situation

Many participants mentioned that the hardest in caring children for prevent infection is to make some difficult decisions in unexpected situations. After the program some of them reflected decision making skills modulation. The caregivers felt more confident in certain situations where decision-making is required. But if any situation did not resolve themselves, however they still known how to looking for help.

"For over 2 years I had been in a situation where I didn't know how to decide, even just about choosing appropriate foods for my child. I know that some kind of food are not allowed, but my child required to eat. After the session of simulation teaching, I discussed with you to overcome in some situation. Even I did not achieve to making decision according to the program scenario, but I reconsidered and looking for the knowledge that I am lacking. Now, I felt I can handle in some situation such as the way to negotiate with my child regarding to having appropriate food, wearing facial mask whenever stay outside the house." (F, 39)

"The first time my child vomited after taking the medicine. I was shocked and helpless. I only knew I had to bring my child to the hospital as soon as possible. Experience gradually taught me to cope with events, especially deciding to do or not to do something. And after joining this program, I felt that my decisions

were less hesitant. Because I learned to find out the necessary information. Moreover, I learned to have both primary plan and reserve alternative plan for any situation." (M, 44)

"I really like scenario video clips, because it corresponds to the events found in real life. And I often couldn't choose, however after the clip and discussing with you (researcher) I felt more confident if something happens at least the events are similar to the scenario. (F, 60)

Being a significant agent

Not surprisingly, the sentence most frequently used from participants were "I willing to support children for any possible ways that made children go home with less complications, less suffering from the treatment and ready for next treatment". Even though, most family caregivers really keep in mind that it is their responsibility to care for children. But, according to long term treatment and the exhaustion from taking care of the patients, caregiver burden can be occurred. Sometimes caregivers felt discourages, hopeless and lack of strength, this could be causing caregivers to be negligent or careless in some details of care. Consequently, may be the cause of inappropriate infection prevention behaviors. Accordingly, promoting motivation with various techniques in the program has reflected the results of being encouraged to perform infection prevention behavior.

"I do love the feeling of I am the most importantly person who has responsible to protect my child from any kind of harm. Because everyone always said that, being a mother, its normal responsible to look after your kid. But, I just need some appreciate from others." (F, 42)

"Initially, I never thought that would be important to establish a goal of behavior. Now, I feel like having a goal of doing something even as a small goal, it keeps me motivated to do until achieve a goal. (M, 43)

"I honestly confess that, in the past I had neglected some actions because I felt it was unnecessary such as strictly washing my hand or cleaning fabric facial mask every day. But, after participating in the activity, I felt that everything is important and I'm an important one of keeping him free from infection."(M, 39)

"At first, I felt a little worried about how to cover all of your requirement regarding perform those behavior although I perceive the benefit of doing this. On the 4th meeting that you (researcher) convinced me to think about what it maybe happen when returning home. Moreover, you helped me to plan and manage housewares environment as possible for prevent risk to infection. This is the new experience to me and my family for special concerning from nurse and make me enthusiastic to support my child for any possible ways." (F, 29)

Summary

In this study, a hypothesis testing was done using by using independent t- test by designating statistical significance at .05. The characteristics of the samples in the experimental and control groups were not significantly different. The different scores of infection prevention behavior was significantly different according to the interaction effect from PPIPB supporting the hypotheses.

CHAPTER V

DISSCUSSION, IMPLICATION, AND RECOMMENDATION

Summary of the study

This study is a quasi-experimental research aiming to compare infection prevention behaviors of family caregivers of pre-school age children with acute lymphoblastic leukemia between who receive the program promoting infection behavior and those receiving conventional care. The sample was composed of 45 family caregivers of pre-school age children with acute lymphoblastic leukemia who were admitted in pediatric IPD, Phramongkutklao Hospital. The family caregiver whose characteristic met the inclusion criteria were included to the study. 23 were randomly assigned into the control group and 23 caregivers in the experimental group. During the study one caregiver in the control group dropped out because failed to maintain follow up for post evaluation. Thus, the numbers of caregivers in control group were 22. Family caregivers in the experimental group participated in program promoting infection prevention behaviors whereas patients in the control group received the conventional nursing care from nurses. The Mann-Whitney U test performed for data analysis. The results were discussed according to the research hypothesis, as presented below followed by detailed discussion of their implication. Limitations of the study and suggestions for future research are also considered.

This chapter presents a discussion of the research findings. It presents characteristics of the participants; elaborates the effects of the program promoting infection prevention behaviors; discusses the theoretical aspects; and finally, considers methodological issues.

Discussion

The result illustrated that the mean of difference scores of infection prevention behavior in the experimental group (Mean=4.78, SD=3.93) had higher than that in control group (Mean=0.64, SD=0.73). Thus, the family caregivers who received the program promoting infection prevention behavior achieve the difference scores (d) of infection prevention behaviors higher than the family caregivers who's received the conventional nursing care. The results supported the hypothesis of the study.

The efficacious of PPIPB based on infection prevention behaviors recommended by American Cancer Society (2013) and Thai pediatric oncology group(2016)encompassed three major dimension of infection prevention behaviors for perform appropriate infection prevention behaviors including ;medication administration, infection control and infection surveillance. The research finding also reveal the family caregivers who received the program promoting infection prevention behavior achieve the difference scores (d) of medication administration, infection control and infection surveillance higher than the family caregivers who's received the conventional nursing care.

Performing dependent care, a person needs to have sufficient dependent care agency to create dependent care. The program promoting infection prevention behavior effect to those behaviors by improving the dependent care agency. In the present study, dependent-care agency is conceptualized as the capabilities of the family caregivers to know and meet their child's therapeutic self-care demand and

also exercise and continue to develop dependent care capability. Which included estimative operation, transitional operation, and productive operation. Estimative operation is seeking knowledge and understanding about a situation and what should be done to control that situation. Transitional operation is making a decision about dependent-care and productive operation is actions for meeting dependent-care demands, monitoring dependent-care practice (i.e., actions, results, effects), and decisions about subsequence actions. People can make a decision (transitional operation) to begin and maintain dependent-care actions (productive operation) if they have success in their investigation about their dependent-care (estimative operation). In this study dependent care agency of caregiver were as

- The ability to acquire knowledge regarding to infection prevention
- The ability to make judgment regarding to infection prevention
- The ability to perform infection prevention behavior

In this case, researcher ensured the effectiveness of the PPIBP in improving dependent care agency for the participants in the experiment group with the validity check instruments (the infection prevention behavior agency visual analogue scale). This validity check instruments was used for the assessment and evaluation dependent care agency. The result revealed that participants met the standard criteria about 90%, the mean score of the participants in the experimental group was 94.12%, and the score of three aspect were:

- The ability to acquire knowledge regarding to infection prevention visual analogue scale = 94.01 %

- The ability to make judgment regarding to infection prevention visual analogue scale = 94.83%

- The ability to perform infection prevention behavior visual analogue scale = 93.68%

Then, the family caregivers who received PPIPB achieved sufficiency dependent care agency to perform infection prevention behaviors.

Moreover, the qualitative data from participants in experimental group after receiving PPIPB illustrated the increasing of dependent care agency. There were clear examples of how participants improved dependent care agency. The participant reported they gained more confidences to finding the knowledge of the infection prevention behavior, even in case of elderly caregiver. The caregivers had discretion in selecting reliable information, Moreover, some participants learned to gain their knowledge.

"I have more confident in seeking knowledge or ask the questions to the healthcare personals, because all the time I was not keen to ask my doctor or nurse for information regarding caring my child". (F,56) and (F,60)

Furthermore, many participants mentioned that the hardest in caring children for prevent infection is to make some difficult decisions in unexpected situations.

After the program, some of them reflected decision making skills modulation. The caregivers felt more confident in certain situations where decision-making is required. But if any situation did not resolve themselves, however they still known how to looking for help.

"For over 2 years I had been in a situation where I didn't know how to decide, even just about choosing appropriate foods for my child. I know that some kind of food are not allowed, but my child required to eat. After the session of simulation teaching, I discussed with you to overcome in some situation. Even I did not achieve to making decision according to the program scenario, but I reconsidered and looking for the knowledge that I am lacking. Now, I felt I can handle in some situation such as the way to negotiate with my child regarding to having appropriate food, wearing facial mask whenever stay outside the house." (F, 39)

The program promoting infection prevention behavior effect to those behaviors by improving the dependent care agency by intervening 4 essential power components of dependent care agency. Additionally, the researcher used a combination of helping techniques; teaching, support guidance, consult, and providing a suitable environment, using the circumstances of a good relationship among researcher, caregivers and preschool age patients. These techniques would build trust and a good relationship between researcher and caregivers. All these

methods stimulated the caregivers to develop about infection prevention behavior and gave them internal motivation to change their behavior

The result of this research congruence with the study of Sen-Ngam, Pratepchaikul & Phuwathananon (2005) who used an educational program for improving maternal knowledge and practice in caring for children with leukemia. The researcher applied educational program by teaching technique, the study revealed that there was a significant difference between maternal knowledge in control and experimental groups ($p < .05$).(Sen-Ngam, Pratepchaikul, & Phuwathananon, 2005). Although, the result of both study were congruence, but the participant in PPIPB not only increased knowledge regarding infection prevention behaviors, but they also increased ability to acquired knowledge by themselves.

This result also was consistent with the study of Penporn, Wanida and Arunrat (2019) which concluded teaching and training skills based on the learning theory of Gagné, Briggs and Wager to improve knowledge and behavior of caregivers to prevent infection in preschool-aged children with leukemia. Caregivers in the experimental group had significantly higher knowledge score of infection prevention than those in the control group ($F = 71.29$, $p < .05$). In addition, caregivers in the experimental group also had significantly higher behavior scores in infection prevention than those in the control group ($F = 37.31$, $p < .05$). Considering teaching and training skills based

on the learning theory in the study, positive reinforcement and empowerment strategy was applied in many session of intervention.

Which is in agreement with the studies of Wansa, Nongluk, Pornsri Sriussadaporn and Wanida Sanasuttipun (2009). They evaluated the effects of an empowerment program on caregivers' competence in caring for preschool children with acute leukemia undergoing chemotherapy fifteen caregivers in the experimental group participated in the 9 session empowerment program to enhance knowledge and competence in caring for acute leukemia in children undergoing chemotherapy. Results revealed that the mean scores of caregiver knowledge and competence in the experimental group were statistically, significantly higher than those in the control group.

For the result of motivation improvement in family caregivers after receiving the program, thus the strength in using SCD was supported. Hence, motivation is crucial power component in achieving in dependent care and the evidence from this study illustrated the effect of SCDT in improving motivation. Therefore, the psychological dimension remained in the theoretical concern. Some of participants those received PPIPB expressed their emotional during the program and they reflected the satisfaction of emotional support from the researcher.

Considering in the detail of crucial behavior, the result from the pretest indicate the behavior of children's oral checkup is the most neglected behaviors.

Some of caregivers never investigate the oral hygiene of their child due to their child did not cooperate or denial from painful. After personal coaching by the method of demonstration and return demonstration combination with the approach technique for oral investigation guidance. The caregivers in the experimental group improved ability to perform children's oral checkup skill with confidently.

Furthermore, the researcher used a combination of helping techniques; teaching, support guidance, consult, and providing a suitable environment, using the circumstances of a good relationship among researcher, caregivers and preschool age patients. These techniques would build trust and a good relationship between researcher and caregivers. All these methods stimulated the caregivers to develop about infection prevention behavior and gave them internal motivation to change their behavior.

In conclusion, the application of the Self-Care Deficit theory demonstrated the successful improvement of infection prevention behaviors in family caregivers of pre-school age children with acute lymphoblastic leukemia. It showed the family caregivers achieve sufficiency dependent care agency from the program. The nursing interventions in the program intervened all 4 significant power components by used the method of guiding, teaching, coaching and providing the developmental environment. Therefore, the caregivers who received the program had sufficiency ability to acquire technical knowledge regarding infection prevention behavior,

sufficiency ability to make decisions about infection prevention behavior, sufficiency ability to perform infection prevention behavior and sufficiency motivation to perform infection prevention behavior. Consequently, all these methods stimulated the caregivers to achieved infection prevention behavior agency and finally, the caregivers improved their infection prevention behaviors.

Limitation

Nevertheless, the data collecting process was performed during the situation of COVID-19 outbreak pandemic situation, thread to internal validity should be justified. The effect of those situation might be interfere the outcome of intervention by caregiver's behavioral change. The awareness of some infection prevention behaviors especially often hand washing and wearing facial mask was normally increased. Seem like thread to internal validity, on the other hand this threat effect to both group equally. The participant in both groups achieved this two behaviors before enrolled the study. In conclusion, this threat interfered to both group and the result of the study remained valid.

This study are encouraged for implementation although there was a limitation of generalizability due to the sample size. According to the data collecting process was performed during the situation of COVID-19 outbreak pandemic situation. Those phenomena effected to the treatment protocol modification, the shorten length of

stay in the hospital and also the decline number of the new cases of preschool-age children with ALL. The policy was declared for avoiding the patient's travel and preventing of transmission, therefore the number of the participant could not reach the target sample size, the results may plateau.

Another consideration is the data collecting instrument (IPBQ) and validity check instrument (DCA-VAS). Although, the instruments were tested the psychometric property by done with construct validity, content validity and internal consistency. Howsoever, the issue of instrument development need to be considered for greater standardize instrument to evaluate infection prevention behavior for caregivers or leukemic pediatric patient. The further, this study was conducted without the randomized selection, so that the risk of confounding factors could not be minimized and would affect the rigor of the study.

Research implication and recommendation.

Implications for Nursing Practice

PPIPB should implemented at the pediatric inpatient unit. Individual approach intervention are recommended for family caregivers. This research are confirmed effectiveness of nursing theory based intervention, nurses need to practicing nursing theory utilization. The research result provided the guidance for promoting infection prevention behaviors that which behaviors should pay more attention or less emphasis such as usually hand washing and wearing facial mask became the new

normal behaviors according to outbreak situation. Nurses might be prioritizes those two behaviors in minor sequence.

Implications for Nursing Education

This study emphasized the application of nursing theory to research. Nursing discipline demanded to pay more attention in theory utilization. The curriculum need to provide the valuable of nursing theory since the under graduation study. Nursing is the profession which comprehensive of art and sciences, understanding the theory will provide profound meaning in state of nursing science and expand to scientific decision making process.

Future research recommendation

1. This study should be replicated with extending the longer duration of follow up and sustainable behaviors evaluation.

2. Participants from several geographical areas are needed to increase generalizability of this study.

3. The application of the Self-Care Deficit theory demonstrated the successful improvement dependent care agency in participants. To conduct furthered study, the theory substruction are recommended to apply in another concept within Orem's theory. For strengthens state of science in using theory.

REFERENCES

Afzal S, Ethier M, Dupuis L, Tang L and et.al. (2009). Risk factors for infection-related outcomes during induction therapy for childhood acute lymphoblastic leukemia. Pediatric Infection Disease Journal.; 28(12).

Aish, A. E., & Isenberg, M. J. I. j. o. n. s. (1996). Effects of Orem-based nursing intervention on nutritional self-care of myocardial infarction patients. *33*(3), 259-270.

American Cancer Society, Cancer Facts & Figures, 2008. Retrieved from http:// www.cancer.org/downloads/STT/2008CAFFfinalsecured.pdf2008.January29, 2008.

Armer, J. M., Shook, R. P., Schneider, K. S., Brooks, C. W., Peterson, J., & Stewart, B. (2009). Enhancing Supportive-Educative Nursing Systems to Reduce Risk of Post-Breast Cancer Lymphedema. *Self-Care Depend Care Nurs. 17*(1), 6-15.

Ball, J., Bindler, R. M., & Cowen, K. J. (2012). *Principles of pediatric nursing: Caring for children (Fifth edition.)*. Boston: Pearson.

Bailey, L. C., Reilly, A. F., & Rheingold, S. R. (2009). Infections in pediatric patients with hematologic malignancies. *Semin Hematol, 46*(3), 313-324. doi:10.1053/j.seminhematol.2009.03.010

Balling K, McCubbin M. (2001). Hospitalized children with chronic illness: Parental

caregiving needs and valuing parental expertise. J Pediatr Nurs. 2001; 16(2): 110 119.

Banfield, B. E. (2011). Environment:A Perspective of the Self-Care Deficit Nursing Theory. *24*(2), 96-100. doi:10.1177/0894318411399457

Barton, C. D., Waugh, L. K., Nielsen, M. J., & Paulus, S. (2015). Febrile neutropenia in children treated for malignancy. Journal of Infection, 71, Supplement 1, S27

Biggs, A. (2008). Orem's Self-Care Deficit Nursing Theory: Update on the State of the Art and Science. *21*(3), 200-206. doi:10.1177/0894318408320140

Bishop L, Dougherty L, Bodenham A, Mansi J, Crowe P, Kibbler C, et al.(2007) Guidelines on the insertion and management of central venous access devices in adults. Journal Compilation; (29): 261-278.

Boonchuay, N., Sanasuttipun, W., Chintanadilok, N., & Sanpakit, K. J. N. S. J. o. T. (2016). The effect of the educational program on knowledge and care behaviors of caregivers of children with thalassemia. *34*(3), 41-53.

Brackett J, Schafer ES, Leung DH, et al.(2014). Use of allopurinol in children with acute lymphoblastic leukemia to reduce skewed thiopurine metabolism. Pediatr Blood Cancer. 2014;61(6):1114–7

Brandt, B. (1990). Nursing protocol for the patient with neutropenia. Oncology Nursing Forum, 17(1 Suppl), 9-15. 17

Brown, N., Gallagher, R., Fowler, C., & Wales, S. (2014). Asthma management self-efficacy in parents of primary school-age children. Journal of Child Health Care, 19 18(2), 133-144. 20

Brown, T. J. H. K. J. o. O. T. (2010). Construct validity: A unitary concept for occupational therapy assessment and measurement. *20*(1), 30-42.

Burley Moore, J. B., Asher E (2004). Children with cancer and their parents: Self-care and dependent-care practices. *Issues in Comprehensive Pediatric Nursing, 27*(1), 1-17.

Bunin GR. (2004). Nongenetic causes of childhood cancers: evidence from international variation, time trends, and risk factor studies. Toxicol ApplPharmacol.;199: 91-103.

Bunyatisai, W., Jia-Mahasap, B., & Chitapanarux, I. (2019). Treatment Outcomes of Acute Lymphoblastic Leukemia in both children and adults using the Thai Pediatric Oncology Group-based protocol at Chiang Mai University hospital. Journal of Thai Association of Radiation Oncology, 25(1), 12-28. Retrieved from https://he01.tci-thaijo.org/index.php/jtaro/article/view/203011

Carter, P. A. J. J. o. N. M. (1998). Self-care agency: the concept and how it is measured. *6*(2), 195-207.

Chatuparisute C, Anunnatsiri S. Febrile neutro¬penia.(2006). Khon Kaen: Faculty of

Medicine, Khon Kaen University;.(in Thai).

Christopher R. F. (2007). Prevent of infection in patient with Cancer Proceeding of Seminars in Oncology Nursing, Vol 23, No 3 (August), 2007: pp 174–183

Cho H. J., Eom H. S., Kim H. J., Kim I. S., Lee G. W., Kong S. Y. (2010). Glutathione-S-transferase genotypes influence the risk of chemotherapy-related toxicities and prognosis in Korean patients with diffuse large B-cell lymphoma. Cancer Genet. Cytogenet. 198 40–46

Cull, L.F., & Nolan, M.B. (2009). Treating neutropenic fever in the emergency department:

Journal of Emergency Nursing, 35(1): 36-39.

Coebergh JW, Reedijk AM, de Vries E, Martos C, Jakab Z, Steliarova-Foucher E, Kamps WA. (2006) Leukaemia incidence and survival in children and adolescents in Europe during 1978–1997: Report from the Automated Childhood Cancer Information System project. Eur J Cancer. 2006;42:2019–2036. S35.

Curry, S. J., & Fitzgibbon, M. L. (2009). Theories of Prevention. In S. A. Shumaker, J. K. Ockene & R. K.A. (Eds.), The handbook of health behaviors change. New YorkSpringer. 28 De Vellis, R. F. (1991). Scale development: Theory and applications. Newbury Park: 29 Sage.

DeVellis, R. F. (2003). *Scale development: Theory and applications (2nd ed.)*. California:

Sage.

Davidson, M. (2014). Known-Groups Validity. In A. C. Michalos (Ed.), *Encyclopedia of Quality of Life and Well-Being Research* (pp. 3481-3482). Dordrecht: Springer Netherlands.

Dennis, C. (1997). *Self-care deficit theory of nursing: Concepts and applications*: Mosby.

Dinh, T. T. H., Bonner, A., Clark, R., Ramsbotham, J., & Hines, S. J. J. E. S. (2016). The effectiveness of the teach-back method on adherence and self-management in health education for people with chronic disease: a systematic review. *14*(1), 210-247

Doane, D. P., & Seward, L. E. J. J. o. S. E. (2011). Measuring Skewness: A Forgotten Statistic? *, 19*(2).

Dockerty, J. D., Skegg, D. C., Elwood, J. M., Herbison, G. P., Becroft, D. M., & Lewis, M. E. (1999). Infections, vaccinations, and the risk of childhood leukaemia. *Br J Cancer, 80*(9), 1483-1489. doi:10.1038/sj.bjc.6690548

Doyle, S. (2010). Bone Marrow in Deborah Tomlinson and Nancy E. Kline (ed). Pediatric Oncology Nursing:Advanced clinical Handbook. pp. 273-290. Berlin Heidelberg: Springer

East, P. (2010). Children's Provision of Family Caregiving: Benefit or Burden? *Child Development Perspectives, 4*, 55-61. doi:10.1111/j.1750-8606.2009.00118.x

Eggenberger, E., Heimerl, K., & Bennett, M. I. (2013). Communication skills training in dementia care: a systematic review of effectiveness, training content, and didactic methods in different care settings. In *Database of Abstracts of Reviews of Effects (DARE): Quality-assessed Reviews [Internet]*: Centre for Reviews and Dissemination (UK).

Elliott, E. S. & Dweck, C. S. (1988). Goal: An approach to motivation and achievement. *Journal of Personality and Social Psychology, 54*(1), 5-12. http://dx.doi.org/10.1037/0022-3514.54.1.5

Engle, P. L. (1995). Psychosocial aspects of care and nutrition. *Food and nutrition bulletin, 16*, 356-377.

Gaffney, K. F., & Moore, J. B. J. N. S. Q. (1996). Testing Orem's theory of self-care deficit: Dependent care agent performance for children. *9*(4), 160-164.

Ghanbari, A., & Pouy, S. J. I. J. o. C. S. (2018). Designing nursing care program based on Johnson behavioral model in children with acute lymphoblastic leukemia: a case study. *11*(1), 631.

Freeman, M.C., et al. (2014). Hygiene and health: systematic review of hand washing practices worldwide and update of health effects. Tropical Medicine and International Health. 19(8): 906–916.

Flyge, H. A. (1993). Meetingthe challenge of neutropenia. Nursing. 23(7): 61-64.Garcia SJ,

Krsnik I, Reyes E, Miguel DD, Hernanz N, Barr-Ali M, et al. (2003) Elderly hematological patients with chemotherapy-induced febrile neutropenia have similar rates of infection and outcome to younger adults: a prospective study of risk - adapted therapy. British Journal of Hematology; (120): 209 – 216.

Fleury, J., Sidani, S. J. I. R., & Improvement, E.-B. Q. (2018). Using theory to guide intervention research. *2*, 55-78.

Gaffney, K. F., & Moore, J. B. J. N. S. Q. (1996). Testing Orem's theory of self-care deficit: Dependent care agent performance for children. *9*(4), 160-164.

Gedaly-Duff VG, Lee KA, Nail LM, icholson HS, Johnson KP. Pain, sleep disturbance, and fatigue in children with leukemia and their parents: A pilot study. Oncol Nurs Forum.2006; 33(3):641- 646

Gibson C H.(1995).*The process of cement in mothers of chronically ill children*. J Adv Nurs.; 21(6): 1201- 1210.

Gilliss, C. L.; Belza, L L(1992) . *A framework for understanding family caregivers' recovery work after surgery*. Family & Community Health. 15(2):41-48, July

Hunger, S. P., & Mullighan, C. G. (2015). Acute Lymphoblastic Leukemia in Children. *373*(16), 1541-1552. doi:10.1056/NEJMra1400972

Hutheerat P. Treatment of Childhood cancer. In: Huttheerat P, Juansumlit A, & Isarangkul P. *Hematology in Childhood. 3rd ed.* Bangkok: Chaijalearn Company;

1995.p. 421-434.

Jinsupawong P.(2004). Need of caregivers in caring for leukemia children at home. Nursing [dissertation]. Chiangmai: Chiangmai University;

Juangpanich U, Onbunreang J, lunlud J, Khan¬sorn T, Vatanasapt P.(2012). Effect of Music Therapy on Anxiety and Pain in Cancer Patients Journal of Nurses' Association of Thailand, North-Eastern Division; 30 (1): 46-52. Afzal, S., Ethier, M.-C., Dupuis, L. L., Tang, L., Punnett, A. S., Richardson, S. E., . . . Sung, L. J. T. P. i. d. j. (2009). Risk factors for infection-related outcomes during induction therapy for childhood acute lymphoblastic leukemia. *28*(12), 1064-1068.

Jansong, W., & Chiyawat, W. (2016). The effect of the nursing intervention based on Pender's health promotion model on infection prevention behaviors in mothers of 1-5 year-old children with cancer undergoing chemotherapy *NURS SCI J THAIL, 37*

Jourdan-Da Silva, N., Perel, Y., Méchinaud, F., Plouvier, E., Gandemer, V., Lutz, P., . . . Clavel, J. (2004). Infectious diseases in the first year of life, perinatal characteristics and childhood acute leukaemia. *Br J Cancer, 90*(1), 139-145. doi:10.1038/sj.bjc.6601384

Kumar, C. P. J. I. J. o. N. T., & Classifications. (2007). Application of Orem's Self-Care Deficit Theory and Standardized Nursing Languages in a Case Study of a Woman

with Diabetes. *18*(3), 103-110.

Larson, E., & Nirenberg, A. (2004). *Evidence-Based Nursing Practice to Prevent Infection in Hospitalized Neutropenic Patients With Cancer.* Paper presented at the Oncology Nursing Forum.

Lighter-Fisher, J., Stanley, K., Phillips, M., Pham, V., & Klejmont, L. M. (2016). Preventing Infections in Children with Cancer. *Pediatr Rev, 37*(6), 247-258. doi:10.1542/pir.2015-0059

Maia Rda, R., & Wünsch Filho, V. (2013). Infection and childhood leukemia: review of evidence. *Rev Saude Publica, 47*(6), 1172-1185. doi:10.1590/s0034-8910.2013047004753

McKinney, P. A., Juszczak, E., Findlay, E., Smith, K., & Thomson, C. S. (1999). Pre- and perinatal risk factors for childhood leukaemia and other malignancies: a Scottish case control study. *Br J Cancer, 80*(11), 1844-1851. doi:10.1038/sj.bjc.6690609

Meijel, B., Gamel, C., Swieten-Duijfjes, B., & Grypdonck, M. H. F. (2004). The development of evidence-based nursing interventions: Methodological considerations. *Journal of advanced nursing, 48*, 84-92. doi:10.1111/j.1365-2648.2004.03171.x

Melnyk, B. M., & Morrison-Beedy, D. (2019). Intervention research and evidence-based quality improvement.

National Cancer Institute. (2014) SEER Stat Fact Sheets: Acute Lymphocytic Leukemia.Epider¬miology and End Results.

National Cancer Institute. Radiation Risks and Pediatric Computed Tomography (CT): A Guide for Health Care Providers. Available from URL: http://www.cancer.gov/cancertopics/causes/radiation/radiationrisks-pediatric-

OREM. (1989). Self-care deficit theory of nursing.

Orem. (2001). *Nursing concepts of practice (6th ed.). St. Louis, MO: Mosby* (6th ed.): St. Louis, MO: Mosby

P.R., U. (1990). *Orem's self-care model: principles and general applications. In: Psychiatric and Mental Health Nursing.* Boston: Springer.

Paasche-Orlow, M. K., Schillinger, D., Greene, S. M., & Wagner, E. H. J. J. o. G. I. M. (2006). How health care systems can begin to address the challenge of limited literacy. *21*(8), 884-887.

Paprom, W., & Tangworaphonkchai, J. (2014). The effect of an oral mucositis care innovation on caregivers' care behavior among pre-school children with leukemia receiving consolidation phase chemotherapy. *Journal of Nursing Science Health, 37*(1), 21-29.

Perrillat, F., Clavel, J., Auclerc, M. F., Baruchel, A., Leverger, G., Nelken, B., . . . Hémon, D. (2002). Day-care, early common infections and childhood acute leukaemia: a

multicentre French case-control study. *Br J Cancer, 86*(7), 1064-1069. doi:10.1038/sj.bjc.6600091

Pett, M. A. (2015). Nonparametric statistics for health care research: Statistics for small samples and unusual distributions: Sage Publications.

Pizzo, P. A., Rubin, M., Freifeld, A., & Walsh, T. J. J. T. J. o. p. (1991). The child with cancer and infection. I. Empiric therapy for fever and neutropenia, and preventive strategies. *119*(5), 679-694.

Rosenbaum, P. F., Buck, G. M., & Brecher, M. L. (2000). Early Child-Care and Preschool Experiences and the Risk of Childhood Acute Lymphoblastic Leukemia. *American Journal of Epidemiology, 152*(12), 1136-1144. doi:10.1093/aje/152.12.1136 %J American Journal of Epidemiology

Saeui, W., Chintanadilo, N., Sriussadaporn, P., & Sanasuttipun, W. J. J. N. S. (2009). The effects of an empowerment program on the competence of caregivers in caring for preschool children with acute leukemia undergoing chemotherapy. *27*(2), S1.

Schultz, K. R., Pullen, D. J., Sather, H. N., Shuster, J. J., Devidas, M., Borowitz, M. J., . . . Camitta, B. M. (2007). Risk- and response-based classification of childhood B-precursor acute lymphoblastic leukemia: a combined analysis of prognostic markers from the Pediatric Oncology Group (POG) and Children's Cancer Group (CCG). *Blood, 109*(3), 926-935. doi:10.1182/blood-2006-01-024729

Sen-Ngam, K., Pratepchaikul, L., & Phuwathananon, K. J. S. M. J. (2005). Maternal knowledge and practice development in caring for children with leukemia. *23*, 261-268.

Shah, M., Abdullah, A., & Khan, H. J. I. J. N. D. (2015). Compare and contrast of grand theories: Orem's self-care deficit theory and roy's adaptation model. *5*(1).

Shoghi, M., Shahbazi, B., & Seyedfatemi, N. J. A. P. J. o. C. P. A. (2019). The Effect of the Family-Centered Empowerment Model (FCEM) on the Care Burden of the Parents of Children Diagnosed with Cancer. *20*(6), 1757.

Sigalet, E., Cheng, A., Donnon, T., Koot, D., Chatfield, J., Robinson, T., . . . health, c. (2014). A simulation-based intervention teaching seizure management to caregivers: A randomized controlled pilot study. *19*(7), 373-378.

Simpson, J., Smith, A., Ansell, P., & Roman, E. (2007). Childhood leukaemia and infectious exposure: a report from the United Kingdom Childhood Cancer Study (UKCCS). *Eur J Cancer, 43*(16), 2396-2403. doi:10.1016/j.ejca.2007.07.027

Siripoon, P., & Tangvoraphonkchal, J. (2014). Effects of a supportive education program on care behavior of beginning to end stage leukemia school age children's dependent care agents. *Journal of Nursing Science, 37*(2), 48-56.

Slater, B. A., Huang, Y., & Dalawari, P. J. T. J. o. E. M. (2017). The impact of teach-back method on retention of key domains of emergency department discharge

instructions. *53*(5), e59-e65.

Smith, M. J., Carpenter, R. D., & Fitzpatrick, J. J. (2015). *Encyclopedia of nursing education*: Springer Publishing Company.

Souza, V. J. O. b. j. o. n. (2002). Conceptual analysis of self-care agency. *1*(3), 3-12.

Taylor, S. G., Renpenning, K. E., Geden, E. A., Neuman, B. M., & Hart, M. A. J. N. S. Q. (2001). A theory of dependent-care: A corollary theory to Orem's theory of self-care. *14*(1), 39-47.

Tofil, N. M., Rutledge, C., Zinkan, J. L., Youngblood, A. Q., Stone, J., Peterson, D. T., . . . White, M. L. J. C. p. (2013). Ventilator caregiver education through the use of high-fidelity pediatric simulators: a pilot study. *52*(11), 1038-1043.

Tremolada, M., Taverna, L., Bonichini, S., Pillon, M., & Biffi, A. (2019). The Developmental Pathways of Preschool Children with Acute Lymphoblastic Leukemia: Communicative and Social Sequelae One Year after Treatment. *Children, 6*. doi:10.3390/children6080092

Wilson, F. L., Baker, L. M., Nordstrom, C. K., & Legwand, C. (2008). Using the Teach-Back and Orem's Self-Care Deficit Nursing Theory to Increase Childhood Immunization Communication Among Low-Income Mothers. *Issues in Comprehensive Pediatric Nursing, 31*(1), 7-22. doi:10.1080/01460860701877142

Wilson, F. L., Baker, L. M., Nordstrom, C. K., & Legwand, C. J. I. i. c. p. n. (2008). Using the

teach-back and Orem's Self-care Deficit Nursing theory to increase childhood immunization communication among low-income mothers. *31*(1), 7-22.

Wilson, F. L., Mayeta-Peart, A., Parada-Webster, L., & Nordstrom, C. J. J. o. P. N. (2012). Using the teach-back method to increase maternal immunization literacy among low-income pregnant women in Jamaica: a pilot study. *27*(5), 451-459.

Yooyen, P., Sanasuttipun, W., & Srichantaranit, A. (2019). The Effect of a Teaching Program on Knowledge and Behavior of Caregivers to Prevent Infection in Preschool-aged Children with Leukemia. Nursing Science Journal of Thailand, 37(4), 79-92. Retrieved from https://he02.tci-thaijo.org/index.php/ns/article/view/224778

Appendices

Appendix A

Approval of dissertation proposal

ประกาศ

คณะพยาบาลศาสตร์ จุฬาลงกรณ์มหาวิทยาลัย

เรื่อง การอนุมัติหัวข้อดุษฎีนิพนธ์ ครั้งที่ 4/2559 ประจำปีการศึกษา 2559

นิสิตผู้ทำวิจัยและอาจารย์ที่ปรึกษาดุษฎีนิพนธ์

รหัสนิสิต	5777403036
ชื่อ-นามสกุล	พันตรีหญิงสุอารี ล้ำตระกูล
สาขาวิชา	พยาบาลศาสตร์ (นานาชาติ)
ประธานกรรมการ	รองศาสตราจารย์ ดร. ทัศนี ประสบกิตติคุณ
อาจารย์ที่ปรึกษาหลัก	รองศาสตราจารย์ ดร. วราภรณ์ ชัยวัฒน์
อาจารย์ที่ปรึกษาร่วม	รองศาสตราจารย์ ดร. จินตนา ยูนิพันธุ์
กรรมการ	ผู้ช่วยศาสตราจารย์ ดร. ชนกพร จิตปัญญา
กรรมการ	ผู้ช่วยศาสตราจารย์ ดร. สุนิดา ปรีชาวงษ์
กรรมการภายนอก	ผู้ช่วยศาสตราจารย์ ดร. ณัฐกมล ชาญสาธิตพร
ชื่อหัวข้อดุษฎีนิพนธ์	ผลของโปรแกรมส่งเสริมพฤติกรรมการป้องกันการติดเชื้อ สำหรับผู้ดูแลผู้ป่วยเด็กก่อนวัยเรียนโรคมะเร็งเม็ดเลือดขาวชนิดเฉียบพลัน: การประยุกต์ทฤษฎีพร่องความสามารถในการดูแลตนเองของโอเร็ม THE EFFECT OF THE PROGRAM PROMOTING INFECTION PREVENTION BEHAVIOURS IN FAMILY CAREGIVERS OF PRE-SCHOOL AGE CHILDREN WITH ACUTE LYMPHOBLASTIC LEUKEMIA: THE APPLICATION OF SELF-CARE DEFICIT NURSING THEORY
ครั้งที่อนุมัติ	4/2559
ระดับ	ปริญญาเอก

จากมติคณะกรรมการบริหารคณะพยาบาลศาสตร์ ครั้งที่ 8/2560 วันที่ 26 พฤษภาคม 2560

ประกาศ ณ วันที่ 1 มิถุนายน พ.ศ. 2560

สุรีพร ธนศิลป์

(รองศาสตราจารย์ ดร. สุรีพร ธนศิลป์)

คณบดีคณะพยาบาลศาสตร์

APPENDIX B

Approval of ethical committee of the institution review board of Royal Thai Army Medical Department (IRBRTA)

RL 01_2560

คณะอนุกรรมการพิจารณาโครงการวิจัย กรมแพทย์ทหารบก
ชั้น 5 อาคารพระมงกุฎเกล้าเวชวิทยา วิทยาลัยแพทยศาสตร์พระมงกุฎเกล้า
317/5ถนน ราชวิถี เขตราชเทวี กรุงเทพฯ 10400 โทรศัพท์, (662) 763-4297, (662) 763-4270โทรสาร (662) 354-9011
www.irbrta.pmk.ac.th, www.amed.go.th/rtamed/irbrta/ E-mail; irbrta@yahoo.com, irbrta@amed.go.th

ที่ IRBRTA 742/2563 31 พฤษภาคม 2563

เรื่อง ขอชี้แจงการดำเนินการต่างๆ เกี่ยวกับโครงร่างการวิจัยที่ได้รับการรับรอง

เรียน พันโทหญิง สุอารี ล้ำตระกูล

ตามที่ท่านได้ส่งโครงร่างการวิจัยและเอกสารที่เกี่ยวข้อง เพื่อพิจารณาระเบียบวิธีวิจัยและจริยธรรม ฉบับที่ 2 วันที่ 27 พฤษภาคม 2563 (Q012q/63) เรื่อง "ผลของโปรแกรมส่งเสริมพฤติกรรมการป้องกันการติดเชื้อ สำหรับผู้ดูแลผู้ป่วยเด็กวัยก่อนเรียนโรคมะเร็งเม็ดเลือดขาวชนิดเฉียบพลัน: การประยุกต์ทฤษฎีพร่องความสามารถในการดูแลตนเองของโอเร็ม" [The effect of the program promoting infection prevention behaviors in family caregivers of pre-school age children with acute lymphoblastic leukemia: the application of the Self-Care Deficit theory] นั้น คณะอนุกรรมการฯ ได้พิจารณารับรองโครงร่างการวิจัย เมื่อ 30 พฤษภาคม 2563 ระยะเวลาการรับรอง 1 ปี นับตั้งแต่ วันที่ได้รับการรับรองโครงการวิจัย และความถี่ในการส่งรายงานความก้าวหน้าทุก 1 ปี ผู้วิจัยกรุณาส่งรายงานความก้าวหน้างานวิจัย ภายใน 1 เดือน ก่อนหมดอายุการรับรอง เพื่อพิจารณาการรับรองต่อเนื่อง คณะอนุกรรมการฯ ขอชี้แจงเกี่ยวกับการส่งรายงานต่างๆ มายังคณะอนุกรรมการฯ ดังนี้

(1) แบบรายงานส่วนแก้ไขเพิ่มเติมโครงร่างการวิจัย (Amendment) (RF 12_2562) เมื่อมีการแก้ไขเพิ่มเติมโครงร่างการวิจัย ผู้วิจัยต้องส่งโครงร่างการวิจัยที่มีการแก้ไขเพิ่มเติม เพื่อแจ้งให้คณะอนุกรรมการฯ พิจารณารับรองก่อนดำเนินการตามที่ได้แก้ไขเพิ่มเติม (ยกเว้นในกรณีที่การแก้ไขเพิ่มเติมนั้นกระทำเพื่อความปลอดภัยของอาสาสมัคร)

(2) รายงานความก้าวหน้าของการวิจัย (Progress report) (RF 03_2560) ผู้วิจัยต้องส่งรายงานความก้าวหน้าของการวิจัยตามระยะเวลาที่คณะอนุกรรมการฯ กำหนดและอย่างน้อย 30 วัน ก่อนหมดอายุการรับรอง ในกรณีที่การวิจัยยังไม่สิ้นสุด ผู้วิจัยต้องส่งจดหมายขอต่ออายุการรับรองโครงร่างการวิจัย

(3) รายงานเหตุการณ์ไม่พึงประสงค์ (RF 04_1_2560 หรือ RF 04_2_2560) เมื่อมีเหตุการณ์ไม่พึงประสงค์ชนิดร้ายแรงให้รายงานตามข้อกำหนดของ ICH GCP

(4) รายงานไม่ปฏิบัติตามข้อกำหนด (RF 05_2560) เมื่อมีการเบี่ยงเบนหรือไม่ปฏิบัติตามโครงร่างการวิจัยที่ได้รับการรับรอง

(5) รายงานสรุปผลการวิจัย (Final report) (RF 06_2560) และบทคัดย่อภาษาไทยและ/หรือภาษาอังกฤษเมื่อการวิจัยสิ้นสุดแล้ว

หมายเหตุ สามารถ Download แบบรายงานต่างๆ ได้ที่ http://www.irbrta.pmk.ac.th

จึงเรียนมาเพื่อทราบ

ขอแสดงความนับถือ

พันเอก

(สุธี พานิชกุล)

ประธานคณะอนุกรรมการพิจารณาโครงการวิจัย

กรมแพทย์ทหารบก

สำนักงานคณะอนุกรรมการพิจารณาโครงการวิจัย พบ.

RL 01_2560

คณะอนุกรรมการพิจารณาโครงการวิจัย กรมแพทย์ทหารบก

317/5 ถนนราชวิถี เขตราชเทวี กรุงเทพฯ 10400

ที่ IRBRTA....742..... /2563 **รหัสโครงการ: Q012q/63**

ชื่อโครงการวิจัย : ผลของโปรแกรมส่งเสริมพฤติกรรมการป้องกันการติดเชื้อ สำหรับผู้ดูแลผู้ป่วยเด็กวัยก่อนเรียนโรคมะเร็งเม็ดเลือดขาวชนิดเฉียบพลัน: การประยุกต์ทฤษฎีพร่องความสามารถในการดูแลตนเองของโอเร็ม

[The effect of the program promoting infection prevention behaviors in family caregivers of pre-school age children with acute lymphoblastic leukemia: the application of the Self-Care Deficit theory]

เลขที่โครงการวิจัย : -

ชื่อผู้วิจัยหลัก: พันโทหญิง สุอารี ล้ำตระกูล

สังกัดหน่วยงาน : กองการศึกษา วิทยาลัยกองทัพบก

สถานที่ทำการวิจัย: หอผู้ป่วยกุมารเวชกรรม

เอกสารรับรอง :

(1) แบบรายงานการส่งโครงร่างการวิจัยเพื่อพิจารณา ฉบับที่ 2 ลงวันที่ 27 เมษายน 2563
(2) โครงร่างการวิจัย ฉบับที่ 2 ลงวันที่ 27 พฤษภาคม 2563
(3) เอกสารชี้แจงข้อมูลแก่ผู้เข้าร่วมโครงการวิจัย และหนังสือแสดงเจตนายินยอมเข้าร่วมการวิจัย ฉบับที่ 2 ลงวันที่ 26 พฤษภาคม 2563
(4) ภาคผนวก ก แบบสอบถามข้อมูลส่วนบุคคล และ แบบสอบถามพฤติกรรมป้องกันการติดเชื้อ ฉบับที่ 2 ลงวันที่ 27 พฤษภาคม 2563
(5) ภาคผนวก ข เครื่องมือที่ใช้ในการดำเนินการทดลอง ฉบับที่ 2 ลงวันที่ 27 พฤษภาคม 2563
(6) ภาคผนวก ค เครื่องมือกำกับการทดลอง ฉบับที่ 2 ลงวันที่ 27 พฤษภาคม 2563
(7) ประวัติผู้วิจัย พ.ท.หญิง สุอารี ล้ำตระกูล ฉบับที่ 1.1 ลงวันที่ 10 เมษายน 2563
(8) ประวัติผู้ร่วมวิจัย พ.ต.หญิง วีรวรรณ แก้วใส ฉบับที่ 1.1 ลงวันที่ 10 เมษายน 2563
(9) ประวัติที่ปรึกษา ดร.วราภรณ์ ชัยวัฒน์ ฉบับที่ 1.1 ลงวันที่ 10 เมษายน 2563
(10) ประวัติที่ปรึกษา ดร.จินตนา ยูนิพันธ์ ฉบับที่ 1.1 ลงวันที่ 10 เมษายน 2563

ขอรับรองว่าโครงการดังกล่าวข้างต้นได้ผ่านการพิจารณารับรองจากคณะอนุกรรมการพิจารณาโครงการวิจัยกรมแพทย์ทหารบกว่าสอดคล้องกับแนวทางจริยธรรมสากล ได้แก่ ปฏิญญาเฮลซิงกิ รายงานเบลมองต์แนวทางจริยธรรมสากลสำหรับการวิจัยในมนุษย์ของสภาองค์การสากลด้านวิทยาศาสตร์การแพทย์ (CIOMS) และแนวทางการปฏิบัติการวิจัยที่ดี (ICH GCP)

วันที่รับรองด้านจริยธรรมของโครงร่างการวิจัย: 30 พฤษภาคม 2563
วันสิ้นสุดการรับรอง: 29 พฤษภาคม 2564
ความถี่ของการส่งรายงานความก้าวหน้าของการวิจัย: 1 ปี

พันเอก
(สุธี พานิชกุล)
ประธานคณะอนุกรรมการพิจารณาโครงการวิจัย
กรมแพทย์ทหารบก

APPENDIX C

The certificate of Research Ethic Training course

Certificate of Completion

National Research Council of Thailand (NRCT) and Forum for Ethical Review Committee in Thailand (FERCIT)

Certify that

Suari Lamtrakul

Has completed the ON-LINE RESEARCH ETHICS TRAINING
Course หลักสูตรหลักจริยธรรมการวิจัยในมนุษย์ สำหรับนักศึกษา/นักวิจัย

Date approved
(10/04/2563)

Date expired
(10/04/2566)

S. Songsivilai

(Professor Dr.Sirirurg Songsivilai)
Secretary-General
National Research Council of Thailand

APPENDIX D

Lists of the experts

List of experts

1. Associate Professor Pulsuk Siripul, Ph.D., RN.

   Faculty of Nursing Khonkaen university

2. Associate Professor Jintana Tangvoraponkchai Ph.D., RN.

   Faculty of Nursing Khonkaen university

3. Assistant Professor Autchareeya Patoomwan Ph.D., RN.

   Ramathibodi School of Nursing, Faculty of Medicine Ramathibodi Hospital

   Mahidol University

4. Assistant Professor Srimana Niyomkar Ph.D., RN.

   Faculty of Nursing, Chiang Mai University

5. Ms. Somporn Yapao APN., MSN.

   Advanced Practitioner Nurse (Acute myeoblastic leukemia)

   Department of Nursing Siriraj Hospital

APPENDIX E

Informed consent and information sheets

เอกสารชี้แจงข้อมูลแก่ผู้เข้าร่วมโครงการวิจัย

(Research Subject Information sheet)

ชื่อโครงการวิจัย ผลของโปรแกรมส่งเสริมพฤติกรรมการป้องกันการติดเชื้อ สำหรับผู้ดูแลผู้ป่วยเด็กวัยก่อนเรียนโรคมะเร็งเม็ดเลือดขาวชนิดเฉียบพลัน: การประยุกต์ใช้ทฤษฎีพร่องความสามารถในการดูแลตนเองของโอเร็ม

วันที่ชี้แจง

ชื่อผู้วิจัย พ.ท.หญิง สุอารี ล้ำตระกูล ที่อยู่ บ้านพักข้าราชการกรมแพทย์ทหารบก 499/420 ถ.ศรีอยุธยา แขวงทุ่งพญาไท เขตราชเทวี กทม. เบอร์โทรศัพท์ 097-1585444 (24ชั่วโมง)

สถานที่ทำงานของผู้วิจัย ภาควิชาการพยาบาลกุมารเวชศาสตร์ วิทยาลัยพยาบาลกองทัพบก

ผู้ให้ทุนวิจัย ทุนส่วนตัว

ท่านได้รับการเชิญชวนให้เข้าร่วมในโครงการวิจัยนี้แต่ก่อนที่ท่านจะตกลงใจเข้าร่วมหรือไม่โปรดอ่านข้อความในเอกสารนี้ทั้งหมด เพื่อให้ทราบว่า เหตุใดท่านจึงได้รับเชิญให้เข้าร่วมในโครงการวิจัยนี้ โครงการวิจัยนี้ทำเพื่ออะไร หากท่านเข้าร่วมโครงการวิจัยนี้ท่านจะต้องทำอะไรบ้าง รวมทั้งข้อดีและข้อเสียที่อาจจะเกิดขึ้นในระหว่างการวิจัย

ในเอกสารนี้ อาจมีข้อความที่ท่านอ่านแล้วยังไม่เข้าใจ โปรดสอบถามผู้วิจัยหรือผู้ช่วยผู้วิจัยที่ทำโครงการนี้เพื่อให้อธิบายจนกว่าท่านจะเข้าใจท่านจะได้รับเอกสารนี้ 1 ชุด กลับไปอ่านที่บ้านเพื่อปรึกษาหารือกับญาติพี่น้อง เพื่อน หรือแพทย์ที่ท่านรู้จัก ให้ช่วยตัดสินใจว่าควรจะเข้าร่วมโครงการวิจัยนี้หรือไม่ การเข้าร่วมในโครงการวิจัยครั้งนี้จะต้องเป็น**ความสมัครใจ**ของท่าน ไม่มีการบังคับหรือชักจูง ถึงแม้ท่านจะไม่เข้าร่วมในโครงการวิจัยท่านก็จะได้รับการรักษาพยาบาลตามปกติ การไม่เข้าร่วมหรือถอนตัวจากโครงการวิจัยนี้จะไม่มีผลกระทบต่อการได้รับบริการ การรักษาพยาบาลหรือผลประโยชน์ที่พึงจะได้รับของท่านแต่อย่างใด

โปรดอย่าลงลายมือชื่อของท่านในเอกสารนี้จนกว่าท่านจะแน่ใจว่ามีความประสงค์จะเข้าร่วมในโครงการวิจัยนี้

โครงการวิจัยนี้มีที่มาอย่างไร และวัตถุประสงค์ของโครงการวิจัย

การป้องกันการติดเชื้อเป็นสิ่งสำคัญที่สุดในการดูแลเด็กป่วยโรคมะเร็งเม็ดเลือดขาวชนิดเฉียบพลันวัยก่อนเรียน (3-6 ปี) ที่ได้รับการรักษาด้วยเคมีบำบัด และผู้ป่วยเด็กโรคมะเร็งเม็ดเลือดขาวชนิดเฉียบพลัน วัย3-6 ปี เป็นวัยที่มีความเสี่ยงในการติดเชื้อมากที่สุดเมื่อเปรียบเทียบกับวัยอื่นๆ ในปัจจุบันปัญหาการปฏิบัติพฤติกรรมการป้องกันการติดเชื้อที่ไม่เหมาะสมของผู้ดูแลผู้ป่วยเด็กเหล่านี้นั้น เป็นปัญหาที่เกิดขึ้นทั้งในระดับประเทศ และระดับ

โลก ซึ่งมีรายงานถึงการปฏิบัติพฤติกรรมการติดเชื้อที่ไม่เหมาะสมของผู้ดูแลผู้ป่วยเด็กโรคมะเร็ง ได้แก่ ผู้ดูแลผู้ป่วยเด็กโรคมะเร็งไม่สามารถเตรียมอาหารปราศจากเชื้อที่เหมาะสมสำหรับผู้ป่วยเด็กมะเร็งเม็ดเลือดขาวได้ หรือผู้ดูแลบางรายละเลยการดูแลสุขอนามัยในช่องปากของเด็ก ดังนั้นผู้วิจัยจึงได้มองเห็นความสำคัญของปัญหาดังกล่าวจึงพัฒนา โปรแกรมส่งเสริมพฤติกรรมการป้องกันการติดเชื้อ สำหรับผู้ดูแลผู้ป่วยเด็กวัยก่อนเรียนโรคมะเร็งเม็ดเลือดขาวชนิดเฉียบพลัน: การประยุกต์ใช้ทฤษฎีพร่องความสามารถในการดูแลตนเองของโอเร็ม ขึ้นมา เพื่อส่งเสริมให้ผู้ดูแลผู้ป่วยเด็กเหล่านี้ สามารถเกิดพฤติกรรมการป้องกันการติดเชื้อที่เหมาะสม และจะเกิดประโยชน์สูงสุดต่อกระบวนการรักษา ตลอดจนคุณภาพชีวิตของผู้ป่วยเด็กโรคมะเร็งเม็ดเลือดขาวชนิดเฉียบพลันได้และท่านคือบุคคลสำคัญที่สุดที่เป็นผู้ดูแลบุตรหลานของท่านเพื่อป้องกันการติดเชื้อ โดยโครงการวิจัยในครั้งนี้มีวัตถุประสงค์เพื่อ ศึกษาผลของโปรแกรมส่งเสริมพฤติกรรมการป้องกันการติดเชื้อ ต่อ พฤติกรรมการป้องกันการติดเชื้อสำหรับผู้ดูแลผู้ป่วยเด็กวัยก่อนเรียนโรคมะเร็งเม็ดเลือดขาวชนิดเฉียบพลัน

ท่านได้รับเชิญให้เข้าร่วมโครงการวิจัยนี้เพราะคุณสมบัติที่เหมาะสมดังต่อไปนี้

1) ท่านคือผู้ดูแลหลักของบุตรหลานวัยก่อนเรียนของท่านที่ป่วยด้วยโรคมะเร็งเม็ดเลือดขาวชนิดเฉียบพลันที่รับการรักษาในโรงพยาบาลพระมงกุฎเกล้า เขตราชเทวี กรุงเทพมหานคร

2) ท่านมีประสบการณ์ในการดูแลบุตรหลานที่รับการรักษาด้วยยาเคมีบำบัด

4) ท่านสามารถสื่อสารด้วยภาษาไทยได้

5) ท่านสามารถใช้อุปกรณ์สื่อสารผ่านระบบออนไลน์ได้

ท่านไม่สามารถเข้าร่วมโครงการวิจัยได้หากท่านมีคุณสมบัติดังต่อไปนี้

อาสาสมัครที่ไม่สามารถเข้าร่วมโครงการวิจัยได้จนสิ้นสุดโครงการ

จะมีการทำโครงการวิจัยนี้ที่ใด และมีจำนวนผู้เข้าร่วมโครงการวิจัยทั้งสิ้นเท่าไร

โครงการวิจัยนี้จะมีการดำเนินโครงการที่หอผู้ป่วยกุมารเวช กองกุมารเวชกรรม โรงพยาบาลพระมงกุฎเกล้า โดยมีจำนวนอาสาสมัครทั้งสิ้น 60 คน

ระยะเวลาที่ท่านจะต้องร่วมโครงการวิจัยและจำนวนครั้งที่นัด

หากท่านคืออาสาสมัครในกลุ่มควบคุม ผู้วิจัยจะเข้าพบอาสาสมัครที่หอผู้ป่วยที่บุตรหลานของท่านรับการรักษา ในขณะที่อยู่โรงพยาบาลจำนวน 1 ครั้ง ครั้งละ 20-30 นาที และมีการติดตามทางโทรศัพท์ จำนวน 1 ครั้ง

หลังจากท่านกลับบ้านไปแล้ว 1 สัปดาห์ ครั้งละ 10 นาที โดยท่านจะได้รับการชี้แจงจากผู้วิจัยถึงวัตถุประสงค์ ขั้นตอนการเก็บข้อมูลจากผู้วิจัย และมีการสัมภาษณ์ข้อมูลส่วนบุคคล และให้ท่านตอบแบบสอบถามผ่านระบบออนไลน์

หากท่านคืออาสาสมัครในกลุ่มทดลอง ผู้วิจัยจะเข้าพบอาสาสมัครที่หอผู้ป่วยที่บุตรหลานของท่านรับการรักษา ในขณะที่อยู่โรงพยาบาลจำนวน 5 ครั้ง ในระยะเวลา 1 สัปดาห์ ครั้งละ 20-30 นาที และมีการติดตามทางโทรศัพท์ จำนวน 1 ครั้ง ครั้งละ 10 นาที

กิจกรรมการพยาบาลประกอบไปด้วย

- การสัมภาษณ์ข้อมูลส่วนบุคคล
- การจัดกิจกรรมการพยาบาลโดยใช้กิจกรรมการพยาบาลแบบรายบุคคล ผ่านสื่อการสอนสิ่งพิมพ์และสื่ออิเล็กทรอนิกส์ การสอนผ่านสถานการณ์จำลอง เพื่อส่งเสริมความสามารถในการปฏิบัติพฤติกรรมป้องกันการติดเชื้อ
- การตอบแบบสอบถาม

หากท่านเข้าร่วมโครงการวิจัย ท่านจะต้องปฏิบัติตามขั้นตอน หรือได้รับการปฏิบัติอย่างไร

อาสาสมัครในกลุ่มควบคุม ตลอดโครงการวิจัยท่านจะได้รับการปฏิบัติดังต่อไปนี้

ขณะอยู่โรงพยาบาล

<u>วันแรกในของการรับบุตรหลานของท่านเข้ารับการรักษาในโรงพยาบาล</u>

- ผู้วิจัยจะเข้าพบท่านเป็นรายบุคคลเพื่อชี้แจงรายละเอียดขั้นตอนต่างๆ
- อาสาสมัครกรอกข้อมูลส่วนบุคคล และตอบแบบสอบถามพฤติกรรมป้องกันการติดเชื้อ (แบบสอบถามจำนวน 36ข้อ)
- ได้รับการแนะนำในเรื่องการดูแลผู้ป่วย และข้อมูลสุขภาพ ตามรูปแบบการปฏิบัติของหอผู้ป่วย โดยพยาบาลวิชาชีพ

<u>ก่อนกลับบ้าน</u>

เมื่อกลับบ้าน

ติดตามทางโทรศัพท์ 1 ครั้งและตอบแบบสอบถามผ่านระบบออนไลน์

อาสาสมัครในกลุ่มทดลอง ตลอดโครงการวิจัยท่านจะได้รับการปฏิบัติดังต่อไปนี้

ครั้งที่ 1 : วันแรกในของการรับบุตรหลานของท่านเข้ารับการรักษาในโรงพยาบาล(30นาที)

- ผู้วิจัยจะเข้าพบท่านเป็นรายบุคคลเพื่อชี้แจงรายละเอียดขั้นตอนต่างๆ
- อาสาสมัครกรอกข้อมูลส่วนบุคคล และตอบแบบสอบถามพฤติกรรมป้องกันการติดเชื้อ (แบบสอบถามจำนวน 36 ข้อ)
- ผู้วิจัยและอาสาสมัครร่วมวิเคราะห์ปัญหาและอุปสรรคในการปฏิบัติพฤติกรรมป้องกันการติดเชื้อ
- อาสาสมัครร่วมกับผู้วิจัยวางเป้าหมายในการดูแลบุตรหลานของท่านเพื่อป้องกันการติดเชื้อ

ครั้งที่ 2: วันที่ 2 ของการเข้ารับการรักษาในโรงพยาบาล แบ่งการนัดพบออกเป็น 2 ช่วงเวลา

- การให้คำแนะนำรายบุคคล ช่วงเช้า 30 นาที
- การฝึกทักษะรายบุคคล ช่วงเย็น 40 นาที

ครั้งที่ 3: วันที่ 3 ของการเข้ารับการรักษาในโรงพยาบาล(30นาที)

- ผู้วิจัยสอนผ่านสถานการณ์จำลอง โดยใช้คลิปวิดีโอ เรื่อง “หากเป็นคุณจะเลือกทางไหน”
- ผู้วิจัยและอาสาสมัคร ร่วมกันวิเคราะห์สถานการณ์จำลอง

ครั้งที่ 4: วันที่ 5 ของการเข้ารับการรักษาใน (30นาที) ผู้วิจัยพบอาสาสมัครที่หอผู้ป่วย

- ผู้วิจัยเข้าพบอาสาสมัครเพื่อทบทวนความรู้
- ผู้วิจัยวางแผนร่วมกับผู้ดูแลในการจัดหาและควบคุมสภาพแวดล้อมที่จำเป็นโดยเชื่อมโยงกับข้อจำกัดที่เคยประเมินไว้

ครั้งที่ 5: 1 วันก่อนจำหน่ายผู้ป่วยออกจากโรงพยาบาล ผู้วิจัยพบอาสาสมัครที่หอผู้ป่วย

1.อาสาสมัครตอบแบบสอบถามเครื่องมือที่ใช้กำกับการทดลอง

2.ประเมินแผนการปฏิบัติการดูแลเพื่อป้องกันการติดเชื้อที่บ้าน

3.ประเมินความสามารถในการปฏิบัติพฤติกรรมป้องกันการติดเชื้อ และเพิ่มเติมให้คำแนะนำในส่วนที่ยังไม่สมบูรณ์

4.สรุปแผนการปฏิบัติการดูแลเพื่อป้องกันการติดเชื้อที่บ้าน

5.แนะนำช่องทางการติดต่อสื่อสารในกรณีผู้ดูแลต้องการคำแนะนำเพิ่มเติม

เมื่อกลับบ้าน

ติดตามทางโทรศัพท์ 1 ครั้ง หลังผู้ป่วยกลับบ้าน 1 สัปดาห์ และตอบแบบสอบถามผ่านระบบออนไลน์

ความไม่สุขสบาย หรือความเสี่ยงต่ออันตรายที่อาจจะได้รับจากกรรมวิธีการวิจัยมีอะไรบ้าง และวิธีการป้องกัน/แก้ไขที่ผู้วิจัยเตรียมไว้หากมีเหตุการณ์ดังกล่าวเกิดขึ้น

การศึกษาครั้งนี้เป็นการจัดกิจกรรมการพยาบาลโดยใช้การให้คำแนะนำรายบุคคลเป็นกิจกรรมหลัก และใช้การประเมินผลเป็นการตอบแบบสอบถาม จึงไม่มีผลข้างเคียงที่กระทบต่อด้านร่างกายของท่าน และไม่มีผลกระทบต่อการรักษาบุตรหลานที่อยู่ในความดูแลของท่าน อาสมัครมีสิทธิที่จะปฏิเสธการตอบแบบสอบถาม หรือถอนตัวออกจากการศึกษาครั้งนี้ได้ทุกเวลาที่ต้องการ ทั้งนี้ การปฏิเสธจะไม่ก่อให้เกิดอันตราย หรือผลกระทบใดๆ ต่ออาสาสมัคร

เนื่องด้วยทางผู้วิจัยได้เห็นถึงความสำคัญของการลดความเสี่ยงของอาสาสมัครในช่วงที่มีการระบาดของโรค Covid- 19 และเนื่องด้วยการวิจัยในครั้งนี้มีความจำเป็นที่จะต้องเข้าพบอาสาสมัคร เพื่อดำเนินการวิจัย และมีผลต่อการลดตัวแปรแทรกซ้อน ตลอดจนในอาสาสมัครบางรายมีข้อจำกัดในการใช้อุปกรณ์สื่อสารออนไลน์ ผู้วิจัยจึงมีมาตรการในการป้องกันการแพร่กระจายของโรคดังนี้

การจัดสถานที่ในการเข้าพบอาสาสมัคร

1.มีการทำความสะอาดห้อง โต๊ะ เก้าอี้ ก่อนและหลังการใช้งานด้วยน้ำยาฆ่าเชื้อทุกครั้ง

2.การจัดระยะห่างในการทำกิจกรรมพยาบาล มีระยะห่างระหว่างผู้วิจัยและอาสามาสมัคร 1.5 – 2 เมตร

การป้องกันความเสี่ยงต่อการสัมผัสเชื้อที่จะเกิดกับอาสาสมัครและผู้วิจัย

1. การเข้าพบกลุ่มอาสาสมัครทุกครั้งเป็นการเข้าพบรายบุคคล (มีเพียงผู้วิจัยและอาสาสมัคร)

2. ผู้วิจัยมีการจัดเตรียมหน้ากากอนามัย, Face shield และเจลแอลกอฮอล์ ไว้สำหรับอาสาสมัคร ก่อนดำเนินกิจกรรมการพยาบาลทุกครั้งผู้วิจัยและอาสาสมัครจะต้องประเมินอุณหภูมิกายและ ล้างมืออย่างถูกวิธี

3. รูปแบบการตอบสอบถามเป็นแบบออนไลน์ เพื่อลดการสัมผัสกระดาษหรืออุปกรณ์อันอาจเป็นแหล่งแพร่กระจายเชื้อ

ประโยชน์ที่คาดว่าจะได้รับจากโครงการวิจัย

ประโยชน์ที่ได้จากงานวิจัยในครั้งนี้ อาสาสมัครในกลุ่มทดลองจะได้รับความรู้ในการปฏิบัติพฤติกรรมป้องกันการติดเชื้อ ซึ่งเป็นสิ่งสำคัญอย่างยิ่งที่จะช่วยให้การดูแลบุตรหลานของท่านในช่วงระยะที่รับการรักษาโดยใช้ยาเคมีบำบัด เกิดประสิทธิผลสูงสูด อีกทั้งจะช่วยให้พยาบาลวิชาชีพตลอดจนวิชาชีพทางสุขภาพสามารถทราบถึงแนวทางการส่งเสริมพฤติกรรมการป้องกันการติดเชื้อ ให้กับผู้แลผู้ป่วยเด็กวัยก่อนเรียนโรคมะเร็งเม็ดเลือดขาวชนิด

เฉียบพลัน ซึ่งผลการศึกษาจะสามารถนำไปพัฒนาต่อยอดสำหรับการส่งเสริมพฤติกรรมของผู้ดูแลเด็กวัยก่อนเรียนโรคมะเร็งเม็ดเลือดขาวชนิดเฉียบพลัน ให้มีพฤติกรรมการป้องกันการติดเชื้อที่เหมาะสม ส่งผลให้ลดปัจจัยเสี่ยงในการติดเชื้อสำหรับผู้ป่วยกลุ่มดังกล่าวได้

อาสาสมัครในกลุ่มควบคุม ในระยะเวลาของโครงการวิจัยท่านอาจไม่ได้รับประโยชน์โดยตรงจากการเข้าร่วมในการศึกษานี้ แต่ผลการศึกษาอาจจะช่วยให้พยาบาลวิชาชีพตลอดจนวิชาชีพทางสุขภาพสามารถทราบถึงแนวทางการส่งเสริมพฤติกรรมการป้องกันการติดเชื้อ ให้กับผู้แลผู้ป่วยเด็กวัยก่อนเรียนโรคมะเร็งเม็ดเลือดขาวชนิดเฉียบพลัน ซึ่งผลการศึกษาจะสามารถนำไปพัฒนาต่อยอดสำหรับการส่งเสริมพฤติกรรมของผู้ดูแลเด็กวัยก่อนเรียน โรคมะเร็งเม็ดเลือดขาวชนิดเฉียบพลัน ให้มีพฤติกรรมการป้องกันการติดเชื้อที่เหมาะสม ส่งผลให้ลดปัจจัยเสี่ยงในการติดเชื้อสำหรับผู้ป่วยกลุ่มดังกล่าวได้ และเมื่อสิ้นสุดโครงการวิจัย ท่านจะได้รับกิจกรรมการพยาบาลตามโปรแกรมส่งเสริมพฤติกรรมป้องกันการติดเชื้อ สำหรับผู้ดูแลผู้ป่วยเด็กวัยก่อนเรียนโรคมะเร็งเม็ดเลือดขาวชนิดเฉียบพลัน ผ่านระบบออนไลน์

ค่าใช้จ่ายที่ผู้เข้าร่วมในโครงการวิจัยจะต้องรับผิดชอบ (ถ้ามี)

ไม่มี

ค่าตอบแทนที่จะได้รับเมื่อเข้าร่วมโครงการวิจัย(ถ้ามี)

ไม่มี

หากท่านไม่เข้าร่วมโครงการวิจัยนี้ท่านมีทางเลือกอื่นอย่างไรบ้าง

หากท่านไม่เข้าร่วมโครงการวิจัยนี้บุตรหลานของท่านยังคงได้รับการรักษาพยาบาลและการดูแลตามมาตรฐานปกติ

หากเกิดอันตรายที่เกี่ยวข้องกับโครงการวิจัยนี้ จะติดต่อกับใครและได้รับการปฏิบัติอย่างไร

หากเกิดอันตรายท่านจะได้รับการดูแลรักษาตามมาตรฐาน โดยผู้วิจัยจะรับผิดชอบค่าใช้จ่ายในการดูแลรักษาท่าน ทังนี้ตลอดระยะเวลาในการดำเนินโครงการวิจัย ท่านสามารถติดต่อผู้วิจัยได้ตามรายละเอียดดังต่อไปนี้

ผู้วิจัย พ.ท.หญิง สุอารี ล้ำตระกูล เบอร์โทรศัพท์ 0971585444 (ติดต่อได้24 ชั่วโมง)

สถานที่ติดต่อในเวลาราชการ *ภาควิชาการพยาบาลกุมารเวชศาสตร์ วิทยาลัยพยาบาลกองทัพบก*

สถานที่ติดต่อนอกเวลาราชการ *บ้านพักข้าราชการกรมแพทย์ทหารบก 499/420 ถ.ศรีอยุธยา แขวงทุ่งพญาไท เขตราชเทวี กทม.*

หากท่านมีคำถามที่เกี่ยวข้องกับโครงการวิจัย จะถามใคร

ผู้วิจัย พ.ท.หญิง สุอารี ล้ำตระกูล ที่เบอร์โทรศัพท์ 0971585444 สามารถติดต่อได้ตลอด 24 ชั่วโมง

หากท่านรู้สึกว่าได้รับการปฏิบัติอย่างไม่เป็นธรรมในระหว่างโครงการวิจัยนี้ ท่านอาจแจ้งเรื่องได้ที่

สำนักงานคณะอนุกรรมการพิจารณาโครงการวิจัย กรมแพทย์ทหารบก ชั้น 5 อาคารพระมงกุฎเกล้าเวชวิทยา วิทยาลัยแพทยศาสตร์พระมงกุฎเกล้า 317/5 ถนนราชวิถี เขตราชเทวี กรุงเทพฯ หมายเลขโทรศัพท์ 02-763-4297 และ 02-763-4270

ข้อมูลส่วนตัวของท่านที่ได้จากโครงการวิจัยครั้งนี้จะถูกนำไปใช้ดังต่อไปนี้

ข้อมูลที่ได้จากโครงการวิจัยเพื่อประโยชน์ทางวิชาการโดยไม่เปิดเผยชื่อนามสกุล ที่อยู่ของอาสาสมัครเป็นรายบุคคล และมีมาตรการในการเก็บรักษาข้อมูลส่วนตัวและข้อมูลที่ได้จากโครงการวิจัยจะมีการนำเสนอข้อมูลอย่างไรเช่น ข้อมูลจะถูกส่งไปให้ผู้ให้ทุนวิจัยหรือคณะกรรมการจริยธรรม ฯ เป็นต้น

ท่านจะถอนตัวออกจากโครงการวิจัยหลังจากได้ลงนามเข้าร่วมโครงการวิจัยแล้วได้หรือไม่

อาสมัครมีสิทธิที่จะปฏิเสธการตอบแบบสอบถาม หรือถอนตัวออกจากโครงการวิจัยครั้งนี้ได้ทุกเวลาที่ต้องการ ทั้งนี้ การปฏิเสธจะไม่ก่อให้เกิดอันตราย หรือผลกระทบใดๆ ต่ออาสาสมัคร หรือการรักษาพยาบาลของบุตรหลานที่อยู่ในความดูแลของท่าน

หนังสือแสดงเจตนายินยอมเข้าร่วมการวิจัย

ชื่อโครงการวิจัย ผลของโปรแกรมส่งเสริมพฤติกรรมการป้องกันการติดเชื้อ สำหรับผู้ดูแลผู้ป่วยเด็กวัยก่อนเรียนโรคมะเร็งเม็ดเลือดขาวชนิดเฉียบพลัน

: การประยุกต์ใช้ทฤษฎีพร่องความสามารถในการดูแลตนเองของโอเร็ม

วันที่ลงนาม.....

- ก่อนที่จะลงนามในใบยินยอมให้ทำการวิจัยนี้ ข้าพเจ้าได้รับการอธิบายจากผู้วิจัยถึงวัตถุประสงค์ของการวิจัย วิธีการวิจัย อันตราย หรืออาการที่อาจเกิดขึ้นจากการวิจัย หรือจากยาที่ใช้รวมทั้งประโยชน์ที่คาดว่าจะเกิดขึ้นจากการวิจัยอย่างละเอียด และมีความเข้าใจดีแล้ว
- ผู้วิจัยรับรองว่าจะตอบคำถามที่ข้าพเจ้าสงสัยด้วยความเต็มใจ และไม่ปิดบังซ่อนเร้นจนข้าพเจ้าพอใจ
- ข้าพเจ้าเข้าร่วมในโครงการวิจัยนี้ด้วยความสมัครใจ โดยปราศจากการบังคับหรือชักจูง
- ข้าพเจ้ามีสิทธิที่จะบอกเลิกการเข้าร่วมในโครงการวิจัยเมื่อใดก็ได้ และการบอกเลิกนี้จะไม่มีผลต่อการรักษาพยาบาลที่ข้าพเจ้าจะพึงได้รับในปัจจุบันและในอนาคต

- ผู้วิจัยรับรองว่าจะเก็บข้อมูลเกี่ยวกับตัวข้าพเจ้าเป็นความลับ และจะเปิดเผยเฉพาะในรูปของสรุปผลการวิจัย โดยไม่มีการระบุชื่อนามสกุลของข้าพเจ้าการเปิดเผยข้อมูลเกี่ยวกับตัวข้าพเจ้าต่อหน่วยงานต่างๆ ที่เกี่ยวข้องจะกระทำด้วยเหตุผลทางวิชาการเท่านั้น
- ผู้วิจัยรับรองว่าหากเกิดอันตรายใดๆ จากการวิจัย ข้าพเจ้าจะได้รับการรักษาพยาบาล ตามที่ระบุในเอกสารชี้แจงข้อมูลแก่ผู้เข้าร่วมโครงการวิจัย
- ข้าพเจ้าจะได้รับเอกสารชี้แจงข้อมูลแก่ผู้เข้าร่วมโครงการวิจัย เก็บไว้ 1 ชุด
- ข้าพเจ้าได้รับทราบข้อความข้างต้น มีความเข้าใจดี และลงนามในใบยินยอมด้วยความเต็มใจ

ลงชื่อ.....ผู้เข้าร่วมโครงการวิจัย

(.....ชื่อ-นามสกุล ตัวบรรจง)

ลงชื่อ .....ผู้ดำเนินโครงการวิจัย

(.....ชื่อ-นามสกุล ตัวบรรจง)

ลงชื่อ.....พยาน

(.....ชื่อ -นามสกุล ตัวบรรจง)

ลงชื่อ.....พยาน

(.....ชื่อ -นามสกุล ตัวบรรจง)

ในกรณีที่ผู้เข้าร่วมในโครงการวิจัยอายุน้อยกว่า 18 ปี/ ไม่สามารถตัดสินใจได้ด้วยตนเองและไม่สามารถลงลายมือชื่อด้วยตนเอง

ข้าพเจ้า.....ในฐานะเป็น..... (บิดา-มารดา/สามี-ภรรยา/ผู้ปกครอง/ผู้แทนโดยชอบธรรม) ของ.....อนุญาต ให้..... เข้าร่วมในโครงการวิจัยในครั้งนี้

ลงชื่อ.....บิดามารดา/สามีภรรยา/ผู้ปกครอง/ผู้แทนโดยชอบธรรม

(.....ชื่อ-นามสกุล ตัวบรรจง)

ลงชื่อ.....พยาน

(.....ชื่อ -นามสกุล ตัวบรรจง)

ลงชื่อ.....พยาน

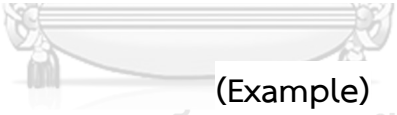
(.....ชื่อ -นามสกุล ตัวบรรจง)

APPENDIX F

The personal information sheet

1) Caregiver Information Sheet

2) Pre-school age with ALL Information Sheet



(Example)

คำชี้แจง

แบบสอบถามข้อมูลส่วนบุคคล

ประกอบด้วย 2 ส่วน ส่วนที่ 1 เป็นคำถามเกี่ยวกับข้อมูลส่วนบุคคลของผู้ดูแลมีจำนวน 9 ข้อ

ส่วนที่ 2 เป็นคำถามเกี่ยวกับข้อมูลส่วนบุคคลของผู้ป่วยเด็กมีจำนวน 5 ข้อ

ส่วนที่ 1 แบบสอบถามเกี่ยวกับข้อมูลส่วนบุคคลของผู้ดูแล

1. ปัจจุบันท่านอายุ.....ปี

2. สถานภาพสมรสของท่านคือ

( ) โสด ( ) คู่ ( ) หย่า ( ) หม้าย ( ) แยกกันอยู่

3. ท่านมีความเกี่ยวข้องสัมพันธ์อะไรกับผู้ป่วยเด็ก ระบุ.....

4. .....

5.....

6.....

7.....

8. .....

9. ท่านได้รับข้อมูลหรือคำแนะนำเกี่ยวกับวิธีป้องกันการติดเชื้อในผู้ป่วยเด็กโรคมะเร็งที่ได้รับยาเคมีบำบัดจาก (ตอบได้มากกว่าหนึ่งข้อ)

( ) แพทย์ ( ) พยาบาล

( ) เพื่อนหรือญาติพี่น้อง ( ) ญาติของเด็กป่วยอื่น

( ) คู่มือการดูแลผู้ป่วยโรคมะเร็ง ( ) แผ่นพับ

( ) อินเตอร์เนต ( ) บอร์ดให้ความรู้

( ) อื่นๆ ระบุ.....

ส่วนที่ 2 ข้อมูลส่วนบุคคลของผู้ป่วยเด็ก

1. ผู้ป่วยอายุ ..... ปี

2. เพศ ( ) ชาย ( ) หญิง

3.....

4.....

5. มาโรงพยาบาลก่อนวันนัดด้วยเรื่อง

( ) ไข้ ( ) มีแผลในปาก

( ) ท้องเสีย ( ) ปัสสาวะแสบขัด กะปริดกะปรอย

( ) ซีด ( ) เลือดออกผิดปกติหรือมีจุดจ้ำเลือด

( ) คลื่นไส้อาเจียน ( ) อื่นๆ ระบุ.....

APPENDIX G

The infection prevention behaviors questionnaires (IPBQ)

: modified version and scores

(Example)

แบบสอบถามพฤติกรรมป้องกันการติดเชื้อ

วัตถุประสงค์ เพื่อประเมินพฤติกรรมป้องกันการติดเชื้อของผู้ดูแล ที่ปฏิบัติต่อเด็กโรคมะเร็งเม็ดเลือดขาวชนิดเฉียบพลันวัยก่อนเรียน

<u>คำชี้แจง :</u> ข้อคำถาม 36 ข้อ ต่อไปนี้เป็นการถามเกี่ยวกับการปฏิบัติของคุณต่อเด็กโรคมะเร็งเม็ดเลือดขาวชนิดเฉียบพลันวัยก่อนเรียนที่คุณดูแลอยู่ ขอให้คุณอ่านข้อความต่อไปนี้ แล้วทำเครื่องหมาย ✓ ใต้ตัวเลือกท้ายข้อคำถามที่ตรงกับการปฏิบัติของคุณในช่วง 1 สัปดาห์ที่ผ่านมา

ทำ หมายถึง คุณปฏิบัติพฤติกรรมนั้น**ทุกครั้ง**

ไม่ทำ หมายถึง คุณปฏิบัติพฤติกรรมนั้น**บางครั้ง**หรือ**ไม่ปฏิบัติเลย**

<u>ตัวอย่างข้อคำถาม</u>

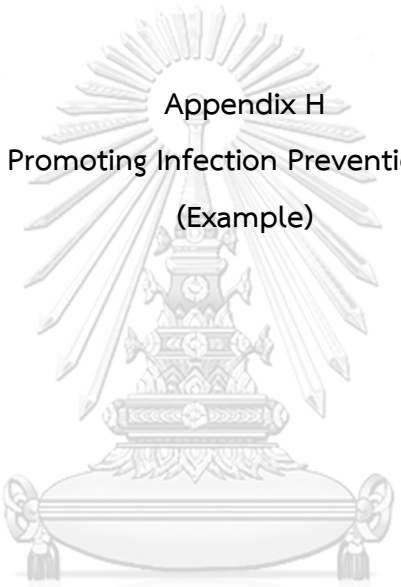
พฤติกรรมป้องกันการติดเชื้อ	**การปฏิบัติ**	
	ทำ	**ไม่ทำ**
1. ฉันดูแลให้เด็กได้รับยาตรงตามชนิดที่แพทย์สั่งทุกครั้ง		

พฤติกรรมป้องกันการติดเชื้อ	**การปฏิบัติ**	
	ทำ	**ไม่ทำ**
1. ฉันดูแลให้เด็กได้รับยาตรงตามชนิดที่แพทย์สั่งทุกครั้ง		
2. ฉันดูแลให้เด็กได้รับยาตรงตามขนาดตามที่พยาบาลแนะนำทุกครั้ง		
3. ฉันดูแลให้เด็กได้รับยาตรงวิธีให้ยาตามที่พยาบาลแนะนำทุกครั้ง		
4. ฉันดูแลให้เด็กได้รับยาตรงตามเวลาที่พยาบาลแนะนำทุกครั้ง		
.....		
.....		
.....		
.....		
.....		
.....		
.....		
35.ฉันประเมินอาการผิดปกติเบื้องต้นที่แสดงถึงภาวะติดเชื้อได้ ได้แก่ การวัดอุณหภูมิร่างกาย การสังเกตการติดเชื้อทางเดินอาหาร การติดเชื้อทางเดินหายใจ การติดเชื้อทางเดินปัสสาวะ และ การติดเชื้อที่ผิวหนัง เป็นประจำ**ทุกวัน**		
36.ฉันพาเด็กไปพบแพทย์ทันทีเมื่อพบอาการผิดปกติ		

Appendix H

The Program Promoting Infection Prevention Behavior (PPIPB)

(Example)



โปรแกรมส่งเสริมพฤติกรรมการป้องกันการติดเชื้อ สำหรับผู้ดูแลผู้ป่วยเด็กวัย

ก่อนเรียนโรคมะเร็งเม็ดเลือดขาวชนิดเฉียบพลัน

โดย พ.ท.หญิง สุอารี ล้ำตระกูล

อาจารย์ที่ปรึกษา รศ.ดร. วราภรณ์ ชัยวัฒน์ และ รศ.ดร. จินตนา ยูนิพันธุ์

โปรแกรมส่งเสริมพฤติกรรมการป้องกันการติดเชื้อ สำหรับผู้ดูแลผู้ป่วยเด็กวัยก่อนเรียนโรคมะเร็งเม็ดเลือดขาวชนิดเฉียบพลัน

ผู้จัดกิจกรรม พันโทหญิง สุอารี ล้ำตระกูล นิสิตหลักสูตรปรัชญาดุษฎีบัณฑิต

ผู้ร่วมกิจกรรม ผู้ดูแลผู้ป่วยเด็กวัยก่อนเรียนโรคมะเร็งเม็ดเลือดขาวชนิดเฉียบพลัน โรงพยาบาลพระมงกุฎเกล้า

สถานที่ ณ ห้องประชุมในหอผู้ป่วยกุมารเวชกรรม และในห้องพักผู้ป่วย

วันที่ วัน...../...../..... **เวลา .....** น.

วัตถุประสงค์ทั่วไป

1.เพื่อให้ผู้ดูแลผู้ป่วยเด็กวัยก่อนเรียนโรคมะเร็งเม็ดเลือดขาวชนิดเฉียบพลัน สามารถระบุความสามารถของตนและข้อจำกัดในการปฏิบัติพฤติกรรมป้องกันการติด

เชื้อ ตลอดจนระบุเป้าหมายในการดูแลผู้ป่วยเด็กเพื่อป้องกันการติดเชื้อได้

2.เพื่อให้ผู้ดูแลผู้ป่วยเด็กวัยก่อนเรียนโรคมะเร็งเม็ดเลือดขาวชนิดเฉียบพลัน ทราบถึงประโยชน์ในการปฏิบัติพฤติกรรมป้องกันการติดเชื้อ

3.เพื่อให้ผู้ดูแลผู้ป่วยเด็กวัยก่อนเรียนโรคมะเร็งเม็ดเลือดขาวชนิดเฉียบพลันมีความรู้ในเรื่องการปฏิบัติพฤติกรรมป้องกันการติดเชื้อ

4.เพื่อให้ผู้ดูแลผู้ป่วยเด็กวัยก่อนเรียนโรคมะเร็งเม็ดเลือดขาวชนิดเฉียบพลัน มีทักษะในการปฏิบัติพฤติกรรมป้องกันการติดเชื้อ

5.เพื่อให้ผู้ดูแลผู้ป่วยเด็กวัยก่อนเรียนโรคมะเร็งเม็ดเลือดขาวชนิดเฉียบพลัน พัฒนากระบวนการตัดสินใจในการปฏิบัติพฤติกรรมป้องกันการติดเชื้อ

โปรแกรมประกอบไปด้วยกิจกรรมการพยาบาล 6 ครั้ง

โดยแบ่งเป็น การเข้าพบผู้ดูแลเพื่อจัดกิจกรรมการพยาบาลในโรงพยาบาล จำนวน 5 ครั้ง

การติดตามเยี่ยมบ้าน (หรือการติดตามทางโทรศัพท์) จำนวน 1 ครั้ง

ผู้ช่วยวิจัยคุณสมบัติ : เป็นพยาบาลวิชาชีพประจำหอผู้ป่วยกุมารเวช 5 โรงพยาบาลพระมงกุฎ

เกล้า มีหน้าที่

1. ดูแลให้ผู้เข้าร่วมวิจัยตอบแบบสอบถามพฤติกรรมการป้องกันการติดเชื้อ (Pre-test) (ทั้งสองกลุ่ม) ในวันแรกของการเข้ารับการรักษาในโรงพยาบาล
2. ดูแลให้ผู้เข้าร่วมวิจัยในกลุ่มทดลองตอบแบบสอบถามกำกับการทดลองในวันแรกของการเข้ารับการรักษาในโรงพยาบาล และ ในกิจกรรมการพยาบาลครั้งที่ 4
3. ดูแลให้ผู้ร่วมวิจัยทั้งสองกลุ่มแบบสอบถามพฤติกรรมการป้องกันการติดเชื้อ (Post-test) ในวันที่มาตรวจตามแพทย์นัด ที่แผนกตรวจโรคผู้ป่วยนอกกุมาเวชกรรม (คลินิกโรคเลือดและมะเร็งในเด็ก)

กิจกรรมการพยาบาลครั้งที่ 1

ระยะเวลา: 30 นาที

วันที่ปฏิบัติ : วันแรกที่ผู้ป่วยเข้ารับการรักษาในโรงพยาบาล

สื่อที่ใช้: สมุดคู่ใจการป้องกันการติดเชื้อ (สมุดบันทึกกิจกรรม)

ผู้ปฏิบัติ : ผู้วิจัยและผู้ช่วยวิจัย

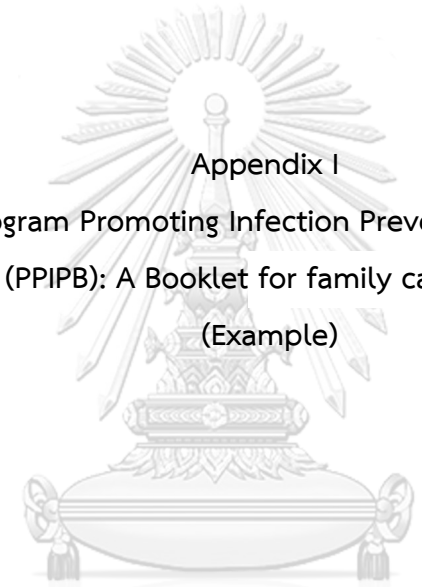
วัตถุประสงค์หลัก

1. สร้างสัมพันธภาพและส่งเสริมให้ผู้ดูแลเกิดแรงจูงใจในการปฏิบัติพฤติกรรม

2.กระตุ้นให้ผู้ดูแลคิดวิเคราะห์เกี่ยวกับความสามารถของและข้อจำกัดของตนเองต่อการปฏิบัติพฤติกรรมป้องกันการติดเชื้อ

3.ผู้ดูแลฯ สามารถระบุเป้าหมายในการดูแลผู้ป่วยเด็กเพื่อป้องกันการติดเชื้อได้

กิจกรรมการพยาบาล
ก่อนเข้าร่วมพบผู้วิจัย ผู้ช่วยวิจัย และผู้ดูแล ประเมินระดับอุณหภูมิร่างกาย สวมหน้ากากอนามัย 1.ผู้วิจัยจัดให้มีผู้ดูแลเด็กในขณะที่จัดกิจกรรมกับผู้ดูแล 2.ผู้วิจัยจัดห้องที่เป็นส่วนตัวสำหรับการจัดกิจกรรม 3. ผู้วิจัยกล่าวทักทายผู้ดูแลด้วยท่าทางเป็นมิตร กล่าวแนะนำตนเองด้วยใบหน้ายิ้มแย้มแจ่มใส สร้างบรรยากาศที่เป็นกันเอง .... 8.หลังจากกระตุ้นให้ผู้ดูแลฯ ประเมินระดับความสามารถที่มี ผู้วิจัยแนะนำแนวทางและเพิ่มเติมข้อมูลที่เป็นประโยชน์และเกี่ยวข้องกับพฤติกรรมป้องกันการติดเชื้อที่ผู้ดูแลฯ ยังมีไม่ครบถ้วน



Appendix I

The Program Promoting Infection Prevention Behavior (PPIPB): A Booklet for family caregivers (Example)

ดูแลด้วยหัวใจ
หนุนห่างไกลการติดเชื้อ

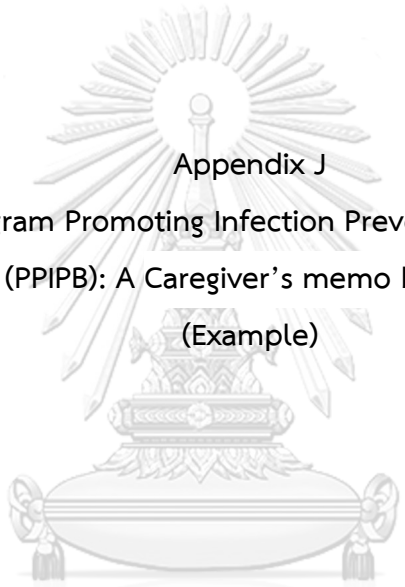
คู่มือสำหรับผู้ดูแล เพื่อป้องกันการติดเชื้อใน ผู้ป่วยเด็กโรคมะเร็งเม็ดเลือดขาวชนิดเฉียบพลัน

จัดทำโดย พ.ท.หญิง สุอารี ล้ำทระกูล

อาจารย์ที่ปรึกษา รศ.ดร.วราภรณ์ ชัยวัฒน์ และ รศ.ดร.จินตนา ยูนิพันธุ์

Appendix J

The Program Promoting Infection Prevention Behavior (PPIPB): A Caregiver's memo booklet (Example)



เพราะคุณคือคนสำคัญในการดูแล
เพื่อป้องกันการติดเชื้อ

Version 2 Date 27/5/63

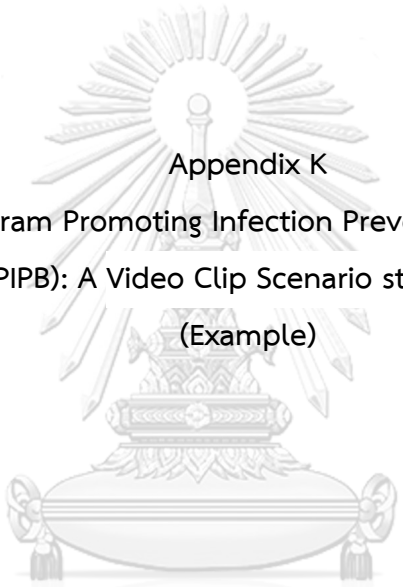
สมุดคู่ใจการป้องกันการติดเชื้อ

สำหรับน้อง .....

บันทึกโดย .....

Appendix K

The Program Promoting Infection Prevention Behavior (PPIPB): A Video Clip Scenario story board (Example)



ภาพยนตร์สั้นสถานการณ์จำลอง “ถ้าเป็นคุณจะเลือกทางใด”

วัตถุประสงค์ เพื่อให้ผู้ดูแลผู้ป่วยเด็กวัยก่อนเรียนโรคมะเร็งเม็ดเลือดขาวชนิดเฉียบพลัน พัฒนากระบวนการตัดสินใจในการปฏิบัติพฤติกรรมป้องกันการติดเชื้อประกอบไปด้วยสถานการณ์จำลองปัญหาในการปฏิบัติพฤติกรรมป้องกันการติดเชื้อที่อาจพบในการดูแลผู้ป่วย

1. สถานการณ์ในการดูแลให้ได้รับยาตามแผนการรักษา

- เด็กบ้วนยาทิ้งหรืออาเจียนหลังกินยา / ลืมให้ยาเด็กตามเวลา/ ไม่มีตู้เย็นเก็บยา

2.สถานการณ์ที่ผู้ดูแลต้องตัดสินใจเลือกสวมหน้ากากอนามัยให้ตนเองและผู้ป่วย

- หน้ากากอนามัยมีขนาดไม่พอดีกับหน้าของเด็ก/ เด็กไม่ให้ความร่วมมือในการใส่หน้ากากอนามัย

3.สถานการณ์ในการดูแลความสะอาดช่องปากในกับผู้ป่วยเด็ก เด็กไม่ให้ความร่วมมือในการแปรงฟัน

4.สถานการณ์ในการล้างมือ / เมื่อมาตรวจที่โรงพยาบาล หรือออกนอกบ้านไม่มีที่ล้างมือ

5.สถานการณ์การตัดสินใจเลือกซื้ออาหารสำหรับผู้ป่วย การเลือกซื้ออาหารปรุงสำเร็จจากภายนอก

6. สถานการณ์การตัดสินใจพาผู้ป่วยไปในสถานที่ต่างๆ / ผู้ป่วยร้องขอไปเล่นกับเพื่อนที่สนามเด็กเล่น

7. สถานการณ์เมื่อพบอาการผิดปกติของผู้ป่วย/ ผู้ป่วยมีไข้สูง

ผู้วิจัยกระตุ้นให้ผู้ดูแลตัดสินใจเลือกปฏิบัติในสถานการณ์เหล่านั้น และโน้มน้าวให้ผู้ดูแลพูดคุยถึงเหตุผลสำหรับการตัดสินใจ และวิธีการเอาชนะหรือชดเชยข้อจำกัดหากในสถานการณ์นั้นผู้ดูแลมีการตัดสินใจที่ไม่ถูกต้อง ให้ผู้วิจัยย้อนกลับมาเพื่อวิเคราะห์สาเหตุ

-ความรู้ที่มีไม่เพียงพอในการตัดสินใจ

-ไม่มั่นใจที่จะตัดสินใจเลือก

-ขาดทักษะในการปฏิบัติที่ถูกต้องจึงไม่สามารถเลือกวิธีปฏิบัติที่ถูกต้องได้

-มีทัศนคติต่อการตัดสินใจในปฏิบัติพฤติกรรมไม่เหมาะสม

กรอบแสดงภาพรวม สถานการณ์จำลองปัญหาพฤติกรรมป้องกันการติดเชื้อที่อาจพบในการดูแลผู้ป่วยเด็ก

สถานการณ์ที่1 สถานการณ์ในการดูแลให้ได้รับยาตามแผนการรักษา

เด็กบ้วนยาทิ้งหรืออาเจียนหลังกินยา

Audio: ในขณะที่คุณกำลังเตรียมยาจะป้อนให้เด็ก
Location: โต๊ะอาหารภายในบ้าน

Audio: เมื่อรับประทานยาเข้าไปเด็กอาเจียนยาออกมาทันที
Location: โต๊ะอาหารภายในบ้าน

Audio: ถ้าเป็นคุณจะทำอย่างไร ระหว่าง งดยามื้อนั้นไปเลย
Location: โต๊ะอาหารภายในบ้าน
Sub: pop up Text ให้เลือกระหว่าง 2 ทางเลือก

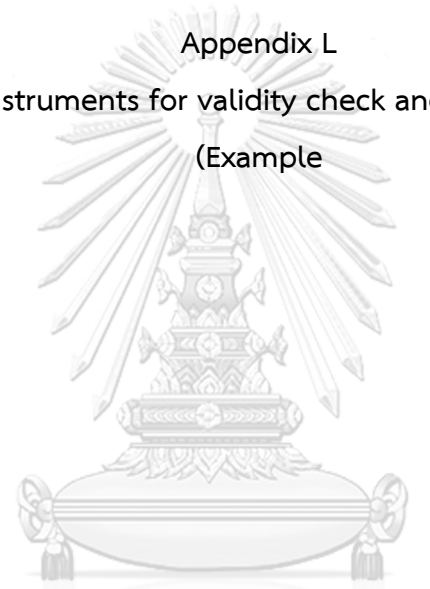
Audio: หรือ รอจนเด็กอาการดีขึ้นจึงป้อนยาใหม่
Location: โต๊ะอาหารภายในบ้าน
Sub: pop up Text ให้เลือกระหว่าง 2 ทางเลือก

Audio: ทำไมคุณจึงเลือก.....
Location: โต๊ะอาหารภายในบ้าน
Sub: pop up Text: ทำไมคุณจึงเลือก.....(ทิ้งเวลาให้ผู้ดูแลอภิปราย)

Appendix L

Instruments for validity check and scores

(Example



เครื่องมือกำกับการทดลอง

เครื่องมือที่ใช้กำกับการทดลอง ประกอบด้วย แบบสอบถามจำนวน 3 ส่วน ดังนี้

<u>ส่วนที่ 1</u>แบบประเมินระดับความสามารถในการแสวงหาความรู้เกี่ยวกับการปฏิบัติพฤติกรรมป้องกันการติดเชื้อของผู้ดูแลเด็กโรคมะเร็งเม็ดเลือดขาววัยก่อนเรียน

ความสามารถในการแสวงหาความรู้หมายถึง การที่คุณรู้ว่าตนเองมีความสามารถในการหาความรู้ทั้งทางตรงและทางอ้อม จากแหล่งความรู้ต่างๆ ไม่ว่าจะเป็นสื่อเอกสารให้ความรู้ บุคลากรทางสุขภาพ หรือผู้ที่มีประสบการณ์ในการดูแลผู้ป่วยเด็ก ในเรื่องนั้นๆ

<u>คำชี้แจงสำหรับกลุ่มตัวอย่าง</u> : แบบสอบถามชุดนี้มีทั้งหมด 14 ข้อ โปรดอ่านข้อความต่อไปนี้แล้วทำเครื่องหมาย **|** ลงบนเส้นตรงตำแหน่งที่ตรงกับความรู้สึกของคุณมากที่สุด

ค่าคะแนนมาก หมายถึง คุณคิดว่าตัวคุณมีความสามารถในการแสวงหาความรู้ ในการปฏิบัติพฤติกรรมนั้นมาก

ค่าคะแนนน้อย หมายถึง คุณคิดว่าตัวคุณมีความสามารถในแสวงการหาความรู้ ในการปฏิบัติพฤติกรรมนั้นน้อย

คุณคิดว่าคุณมีความสามารถในการแสวงหาความรู้ในการปฏิบัติพฤติกรรม 1.ฉันสามารถแสวงหาความรู้เกี่ยวกับการให้ยาแก่เด็กตามที่แพทย์สั่งได้ ไม่มีเลย ——————————— มีมากที่สุด
2. ฉันสามารถหาความรู้เกี่ยวกับอาการข้างเคียงหลังได้รับยาได้ ไม่มีเลย ——————————— มีมากที่สุด
.....
. .....
.....
14.หากฉันมีข้อมูลในการดูแลผู้ป่วยไม่เพียงพอ ฉันสามารถแสวงหาความรู้ที่เกี่ยวข้องจากแหล่งประโยชน์ต่างๆได้ ไม่มีเลย ——————————— มีมากที่สุด

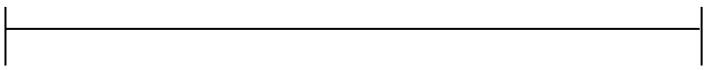
<u>ส่วนที่ 2</u>แบบประเมินความสามารถในการตัดสินใจในการปฏิบัติพฤติกรรมป้องกันการติดเชื้อของผู้ดูแลเด็กโรคมะเร็งเม็ดเลือดขาววัยก่อนเรียน

ความสามารถในการตัดสินใจ หมายถึง การที่คุณสามารถที่จะเลือกปฏิบัติพฤติกรรมต่างๆได้อย่างเหมาะสมเมื่อต้องเผชิญสถานการณ์ที่จำเป็นต้องมีใช้การตัดสินใจ

คำชี้แจง : แบบสอบถามชุดนี้มีทั้งหมด 8 ข้อ โปรดอ่านข้อความต่อไปนี้แล้วทำเครื่องหมาย l ลงบนเส้นตรงตำแหน่งที่ตรงกับความรู้สึกของคุณมากที่สุด

ค่าคะแนนมาก หมายถึง คุณคิดว่าตัวคุณมีความสามารถในการตัดสินใจในการปฏิบัติพฤติกรรมนั้นมาก

ค่าคะแนนน้อย หมายถึง คุณคิดว่าตัวคุณมีความสามารถในการตัดสินใจในการปฏิบัติพฤติกรรมนั้นน้อย

ข้อความ
ฉันสามารถตัดสินใจในการปฏิบัติพฤติกรรม 1. ฉันสามารถตัดสินใจดูแลเด็กได้เมื่อพบว่าเด็กมีอาการข้างเคียงหลังได้รับยา  ไม่มีเลย มีมากที่สุด
2.ฉันสามารถตัดสินใจได้ว่าสถานการณ์ใดที่ฉันควรสวมหน้ากากอนามัย  ไม่มีเลย มีมากที่สุด
.....
.....
.....
7. ฉันสามารถตัดสินใจได้ว่า อาการผิดปกติใดบ้างที่ควรรีบนำผู้ป่วยมาพบแพทย์  ไม่มีเลย มีมากที่สุด

ข้อความ
8. ฉันสามารถตัดสินใจได้ว่า บุคคลใดไม่สามารถเข้าเยี่ยมผู้ป่วยได้ ไม่มีเลย มีมากที่สุด

<u>ส่วนที่3</u>แบบประเมินความสามารถในการปฏิบัติพฤติกรรมป้องกันการติดเชื้อของผู้ดูแลเด็กโรคมะเร็งเม็ดเลือดขาววัยก่อนเรียน

ความสามารถในการปฏิบัติพฤติกรรม หมายถึง คุณสามารถปฏิบัติทักษะสำคัญในพฤติกรรมนั้นได้อย่างเหมาะสม

<u>คำชี้แจง</u> : แบบสอบถามชุดนี้มีทั้งหมด 10 ข้อ โปรดอ่านข้อความต่อไปนี้แล้วทำเครื่องหมาย**|** ลงบนเส้นตรงตำแหน่งที่ตรงกับความรู้สึกของคุณมากที่สุด

ค่าคะแนนมาก หมายถึง คุณคิดว่าตัวคุณมีความสามารถในการปฏิบัติพฤติกรรมนั้นมาก
ค่าคะแนนน้อย หมายถึง คุณคิดว่าตัวคุณมีความสามารถในการปฏิบัติพฤติกรรมนั้นน้อย

ข้อความ
คุณคิดว่าคุณมีความสามารถในการปฏิบัติพฤติกรรมต่อไปนี้
1. ฉันสามารถดูแลให้ยาเด็กได้ถูกต้องตามแพทย์สั่ง ไม่มีเลย มีมากที่สุด
2. ฉันสามารถประเมินอาการของเด็กหากเกิดความผิดปกติหลังได้รับยา ไม่มีเลย มีมากที่สุด
.....

ข้อความ
.....
.....
9. ฉันสามารถตรวจดูช่องปากเด็กเพื่อประเมินความผิดปกติได้ ไม่มีเลย มีมากที่สุด
10.ฉันสามารถประเมินอาการผิดปกติของเด็กที่เกิดจากการติดเชื้อได้ ไม่มีเลย มีมากที่สุด

The Infection prevention behaviors agency scores of family caregivers in experimental group: pre-intervention.

Sample	Ability to acquire knowledge		Ability to make judgment		Ability to perform behaviors	
	Scores (1,400)	%	Scores(800)	%	Scores (1,000)	%
I01	1,240.00	88.57	720.00	90.00	850.00	85.00
I02	980.00	70.00	585.00	73.13	695.00	69.50
I03	1,095.00	78.21	640.00	80.00	750.00	75.00
I04	1,260.00	90.00	660.00	82.50	790.00	79.00
I05	1,165.00	83.21	685.00	85.63	797.00	79.70
I06	1,125.00	80.36	695.00	86.88	758.00	75.80
I07	1,220.00	87.14	655.00	81.88	725.00	72.50
I08	1,220.00	87.14	680.00	85.00	735.00	73.50
I09	1,160.00	82.86	670.00	83.75	810.00	81.00
I10	1,180.00	84.29	715.00	89.38	780.00	78.00
I11	1,225.00	87.50	685.00	85.63	855.00	85.50
I12	1,220.00	87.43	687.00	85.88	830.00	83.00
I13	1,,270.00	90.71	650.00	81.25	810.00	81.00
I14	1,205.00	86.07	700.00	87.50	805.00	80.50
I15	1,275.00	91.07	645.00	80.63	825.00	82.50
I16	1,270.00	90.71	715.00	89.38	875.00	87.50
I17	1,240.00	88.71	725.00	90.63	857.00	85.70
I18	1,235.00	88.21	735.00	91.88	830.00	83.00
I19	1,210.00	86.43	725.00	90.63	780.00	78.00
I20	1,185.00	84.64	750.00	93.75	855.00	85.50
I21	1,265.00	90.36	742.00	92.75	815.00	81.50
I22	1,200.00	85.86	675.00	84.38	875.00	87.50
I23	1,245.00	88.93	690.00	86.25	845.00	84.50

The Infection prevention behaviors agency scores of family caregivers in experimental group: post-intervention.

Sample	Ability to acquire knowledge		Ability to make judgment		Ability to perform behaviors	
	Scores (1,400)	%	Scores(800)	%	Scores (1,000)	%
I01	1310.00	93.50	780.00	97.50	929.00	92.90
I02	1295.00	92.50	770.00	96.25	920.00	92.00
I03	1310.00	93.50	760.00	95.00	929.00	92.90
I04	1295.00	92.50	780.00	97.50	920.00	92.00
I05	1310.00	93.50	770.00	96.25	929.00	92.90
I06	1295.00	92.50	760.00	95.00	920.00	92.00
I07	1310.00	93.50	760.00	95.00	929.00	92.90
I08	1295.00	92.50	760.00	95.00	920.00	92.00
I09	1345.00	96.07	780.00	97.50	955.00	95.50
I10	1340.00	95.71	710.00	88.75*	960.00	96.00
I11	1315.00	93.93	780.00	97.50	935.00	93.50
I12	1310.00	93.50	775.00	96.88	929.00	92.90
I13	1295.00	92.50	760.00	95.00	920.00	92.00
I14	1330.00	95.00	760.00	95.00	950.00	95.00
I15	1335.00	95.36	780.00	97.50	960.00	96.00
I16	1350.00	93.21	750.00	93.75	925.00	92.50
I17	1320.00	94.07	725.00	90.63	932.00	93.20
I18	1340.00	95.71	780.00	97.50	955.00	95.50
I19	1325.00	94.64	775.00	96.88	945.00	94.50
I20	1325.00	94.64	780.00	97.50	950.00	95.00
I21	1355.00	96.79	775.00	96.88	965.00	96.50
I22	1295.00	92.50	690.00	86.25*	925.00	92.50
I23	1325.00	94.64	690.00	86.25*	945.00	94.50

*Not met the criterion level

This table presented the post-intervention infection prevention behaviors agency scores. The most participants archived greater scores than the baseline, nonetheless there were 3 participants could not meet the criterion level of ability to make judgment. They were allowed to review their agency and discussed with the researcher, this process performed until the participants understood and achieved those ability within the supervision of researcher.

Appendix M

SPSS Output

The comparison of infection prevention behavior scores of infection prevention behavior between two group for construct validity testing

Descriptive Statistics

	N	Mean	Std. Deviation	Minimum	Maximum
know_com	20	25.75	7.312	16	34
group2	20	1.50	.513	1	2

Ranks

	group2	N	Mean Rank	Sum of Ranks
know_com	1	10	15.50	155.00
	2	10	5.50	55.00
	Total	20		

Test Statistics[a]

	know_com
Mann-Whitney U	.000
Wilcoxon W	55.000
Z	-3.829
Asymp. Sig. (2-tailed)	.000
Exact Sig. [2*(1-tailed Sig.)]	.000[b]

a. Grouping Variable: group2

b. Not corrected for ties.

Descriptive statistics and analysis of the differences in the general information between the control and experimental groups by use of chi-square.

Gender

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.342[a]	1	.559		
Continuity Correction[b]	.061	1	.805		
Likelihood Ratio	.343	1	.558		
Fisher's Exact Test				.738	.403
Linear-by-Linear Association	.334	1	.563		
N of Valid Cases	45				

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 5.87.

b. Computed only for a 2x2 table

Marital status

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	1.339[a]	3	.720
Likelihood Ratio	1.731	3	.630
Linear-by-Linear Association	.068	1	.794
N of Valid Cases	45		

a. 6 cells (75.0%) have expected count less than 5. The minimum expected count is .49.

Relation to patient

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	1.312[a]	4	.859
Likelihood Ratio	1.332	4	.856
Linear-by-Linear Association	.224	1	.636
N of Valid Cases	45		

a. 6 cells (60.0%) have expected count less than 5. The minimum expected count is 1.47.

Education Level

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	1.312[a]	3	.726
Likelihood Ratio	1.699	3	.637
Linear-by-Linear Association	.196	1	.658
N of Valid Cases	45		

a. 4 cells (50.0%) have expected count less than 5. The minimum expected count is .49.

Occupational

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	.388[a]	3	.943
Likelihood Ratio	.390	3	.942
Linear-by-Linear Association	.234	1	.629
N of Valid Cases	45		

a. 2 cells (25.0%) have expected count less than 5. The minimum expected count is 2.93.

Family income

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	2.254[a]	2	.324
Likelihood Ratio	2.346	2	.309
Linear-by-Linear Association	1.107	1	.293
N of Valid Cases	45		

a. 2 cells (33.3%) have expected count less than 5. The minimum expected count is 3.91.

History of receiving information

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	1.201[a]	1	.273		
Continuity Correction[b]	.626	1	.429		
Likelihood Ratio	1.208	1	.272		
Fisher's Exact Test				.365	.215
Linear-by-Linear Association	1.174	1	.279		
N of Valid Cases	45				

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 8.80.

b. Computed only for a 2x2 table

Gender of preschool age

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.192[a]	1	.661		
Continuity Correction[b]	.019	1	.889		
Likelihood Ratio	.192	1	.661		
Fisher's Exact Test				.768	.445
Linear-by-Linear Association	.188	1	.665		
N of Valid Cases	45				

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 10.27.

b. Computed only for a 2x2 table

Hx of Re admission

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.237[a]	1	.626		
Continuity Correction[b]	.033	1	.855		
Likelihood Ratio	.238	1	.626		
Fisher's Exact Test				.763	.428
Linear-by-Linear Association	.232	1	.630		
N of Valid Cases	45				

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 8.80.

b. Computed only for a 2x2 table

The comparison of pre-test and posttest scores of infection prevention behavior between control group and experimental group.

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Pretest	Equal variances assumed	.001	.981	-.570	43	.572	-.68379	1.19919	-3.10220	1.73461
	Equal variances not assumed			-.572	42.835	.571	-.68379	1.19627	-3.09657	1.72898
Posttest	Equal variances assumed	50.323	.561	-6.049	43	.000	-4.83004	.79845	-6.44028	-3.21980
	Equal variances not assumed			-5.945	26.392	.000	-4.83004	.81239	-6.49873	-3.16135

Assumption testing

The assumptions for the independent t-test were tested before analysis. The following assumptions were examined to ensure the validity of statistical calculations including normality, homogeneity of variance, and independence.

1. Normality distribution of dependent variables was tested. The skewness & kurtosis Z-values index was used to identify the normality of the dependent variables, the values should be as close to zero as possible. The difference score of Infection prevention behavior in control group and experimental group were calculated skewness & kurtosis Z-values. For presenting the normal disability, the result should be as close to zero as possible or Z score within the range of -1.96 to 1.96 and Kurtosis is within the range of -1.96 to 1.96. (Doane & Seward, 2011). The result were as follow:

- The Z scores of skewness and kurtosis of infection prevention behaviors difference scores in control group were 1.43 and -0.72, respectively.

- The Z scores of skewness and kurtosis of infection prevention behaviors difference scores in experimental group were 1.61 and 0.05, respectively.

Regarding the skewness and kurtosis, the data were a little skewed and kurtotic for both group, but it did not significant differ from normality. Consequently, the data were approximately normally distributed, in term of skewness and kurtosis.

2. Homogeneity of variance was required, Levene's test of equality of variance matrices that produced p-values of >.05 indicating no significant differences.

The results illustrated the non-significance (p>.05) among dependent variables which indicated to accept the null hypothesis that variance were equal.

3. Independence, all assumptions regarding to independence were met since infection prevention behaviors scores was measured independently by each participant. This study comprised two groups including the control and the experimental groups.

The three assumptions underlying independent t-test were not violated. Independent t-test was used to compare difference scores of infection prevention behaviors between the experimental group and control group. The table 10 revealed that the mean score of alcohol consumption between 2 groups at pretest was not significant difference at pretest and at posttest was statistically difference at the level of .05.

Test normality of the IPBQ (Difference total Scores)
In control group and experimental group

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
Control_Difference	22	.00	2.00	.6364	.72673	.704	.491	-.682	.953
Experimental_Differnce	23	.00	14.00	4.7826	3.93072	.773	.481	.043	.935
Valid N (listwise)	22								

Test normality of the IPBQ (Difference Score) of each dimension

In control group and experimental group by skewness & kurtosis Z-values

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
Difference score กลุ่มควบคุม	22	.00	2.00	.6364	.72673	.704	.491	-.682	.953
Difference score กลุ่มทดลอง	23	.00	14.00	4.7826	3.93072	.773	.481	.043	.935
Difference score กลุ่มควบคุม ด้านการบริหารยา	22	-1.00	1.00	.0000	.53452	.000	.491	1.179	.953
Difference score กลุ่มทดลอง ด้านการบริหารยา	23	.00	3.00	.6957	.97397	1.331	.481	.876	.935
Difference score กลุ่มควบคุม ด้านการควบคุมการติดเชื้อ	22	.00	2.00	.5909	.59033	.379	.491	-.626	.953
Difference score กลุ่มทดลอง ด้านการควบคุมการติดเชื้อ	23	.00	9.00	3.3478	2.51556	.956	.481	.480	.935
Difference score กลุ่มควบคุม ด้านการเฝ้าระวังการติดเชื้อ	22	-1.00	1.00	.0455	.48573	.147	.491	2.077	.953
Difference score กลุ่มทดลอง ด้านการเฝ้าระวังการติดเชื้อ	23	-1.00	2.00	.7391	1.00983	-.292	.481	-.904	.935
Pretest กลุ่มควบคุม	22	23.00	35.00	28.2727	3.79451	.073	.491	-1.484	.953
Pretest กลุ่มควบคุม Pretest กลุ่มทดลอง	22	24.00	35.00	28.9091	3.58448	.000	.491	-1.585	.953
Posttest กลุ่มทดลอง	23	20.00	35.00	28.9565	4.22631	-.501	.481	-.445	.935
Valid N (listwise)	23 22	31.00	35.00	33.7391	1.32175	-1.154	.481	.386	.935

Hypothesis Testing

Independent t- Test

Independent Samples Test

	Levene's Test for Equality of Variances		t-test for Equality of Means						
								95% Confidence Interval of the Difference	
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Equal variances assumed	22.350	.560	-4.866	43	.000	-4.14625	.85203	-5.86452	-2.42797
Equal variances not assumed			-4.971	23.569	.000	-4.14625	.83413	-5.86947	-2.42302

Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	Estimative_pre & Estimative_post	23	.230	.292
Pair 2	Transitional_pre & Transitional_post	23	-.036	.870
Pair 3	Productive_pre & Productive_post	23	.248	.254

		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		t	Df	Sig-2 tailed
					Lower	Upper			
Pair 1	Estimative_pre - Estimative_post	-7.99391	4.69239	.97843	-10.02305	-5.96477	-8.170	22	.000
Pair 2	Transitional_pre - Transitional_post	-8.80783	6.07893	1.26754	-11.43655	-6.17910	-6.949	22	.000
Pair 3	Productive_pre - Productive_post	-13.04348	4.76672	.99393	-15.10476	-10.98219	-13.123	22	.000

Test for Validity check

in Experimental group Between Pre and Post intervention

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
Estimative_pre	23	70.00	91.07	86.0178	4.81715	-1.900	.481	4.661	.935
Estimative_post	23	92.50	96.79	94.0117	1.30343	.499	.481	-.746	.935
Transitional_pre	23	73.13	93.75	86.0300	4.84404	-.642	.481	.779	.935
Transitional_post	23	86.25	97.50	94.8378	3.50143	-1.629	.481	1.701	.935
Productive_pre	23	69.50	87.50	80.6391	4.91091	-.606	.481	-.282	.935
Productive_post	23	92.00	96.50	93.6826	1.51317	.507	.481	-1.231	.935
DCA_PRE	23	70.63	89.38	84.3402	4.10861	-1.866	.481	4.748	.935
DCA_POST	23	90.94	96.72	94.1161	1.40697	.054	.481	-.110	.935
Valid N (listwise)	23								

Descriptive Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Estimative_pre	86.0178	23	4.81715	1.00444
	Estimative_post	94.0117	23	1.30343	.27178
Pair 2	Transitional_pre	86.0300	23	4.84404	1.01005
	Transitional_post	94.8378	23	3.50143	.73010
Pair 3	Productive_pre	80.6391	23	4.91091	1.02400
	Productive_post	93.6826	23	1.51317	.31552

VITA

NAME	Lt.Col. Su-ari Lamtrakul
DATE OF BIRTH	April 10, 1980
PLACE OF BIRTH	Nakhon pathom province.
INSTITUTIONS ATTENDED	Bachelor of Nursing Science from The Royal Thai Army Nursing College.Bangkok, Thailand in 2002 Master of Nursing Science (Pediatric Nursing) from faculty of nursing, Mahidol University, Thailand in 2008