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Aims and Scope of IJPHS

The International Journal of Public Health and Health Sciences (IJPHS) aims to publish original articles and contributions relevant to public health and medical sciences. IJPHS is published by the Praboromajchanok Institute for Health Workforce Development (PBRI), Ministry of Public Health, Thailand. It is a non-profit, peer-reviewed, open-access; international, scientific journal that publishes articles in areas of health sciences disciplines. The scope of the IJPHS is broad, covering the following categories: original articles, reviewed articles, special articles, case reports, correspondence, and others in the fields of public health, medical sciences and related allied health, especially the following areas:

- Health policy and management, health care and services
- Health promotion, health education and behavioral health
- Environmental and occupational health
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- Global health and Sustainable Development Goals(SDGs)
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Editorial Statement

In the midst of the epidemic of coronavirus disease (COVID-19), which has become emerging infectious diseases caused by viruses causing fear to the world population. The incubation period of the disease is 2-14 days, and most deaths are from respiratory failure. Severe pulmonary infection due to the severity of the disease, all countries have adopted measures to control and inhibit the spread of disease. Thailand is another country with an efficient measure. As a result, the number of infected population continued to decline. As reported by WHO before May 5, 2020, people infected with the Coronavirus 2019 were found only one case and no death in Thailand with the cumulative total of 2,988 cases, 2,747 recoveries, indicating that Thailand has efficient operations that can control the spread of disease have allowed the WHO and many countries show their appreciation for the potential of Thailand in effective disease control.

As one of the authors, we have conducted a study on infectious disease control and COVID-19 operation in the community among village health volunteers (VHVs) in Thailand, the questionnaires survey were conducted via an online on April 15-22, 2020 of 10,400 VHVs. The findings showed the main composition and indicators of success in the control of the COVID-2019 in the rural community in Thailand consisted of 9 elements and 50 indicators. There were the five components that are internal factors, including 1) self-protective behaviors, 2) self-care, 3) hands washing properly, 4) motivation for work, 5) perception of severity of virus and diseases. The four external factors were 6) proactive disease control, 7) communication, planning and following up, 8) data record and report the results and 9) support for equipment and medical supplies.

The editorial board of IJPHS sincerely hope that the members, faculty members, students, medical, nursing and public health personnel as well as alumni who are interested in obtaining more detail from original articles, reviews, and other to use or transform research information into teaching and research fields. In this issue, IJPHS is consisting of five interesting topics covering public health and medical sciences which you can download articles in the journal at the website <https://www.tci-thaijo.org/index.php/ijphs>.

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*Original article***The Relationships between Palliative Care and Quality of Life among Breast Cancer Patients at Adam Malik Central Hospital in Medan, Indonesia***Received: Nov 27, 2019**Accepted: Mar 11, 2020;**Published: Apr 16, 2020*Ivan Elisabeth Purba¹, Taruli Rohana Sinaga² and Rinco Siregar²¹Graduate School Public Health Science, Sari Mutiara Indonesia University²Nursing Studi Program, Sari Mutiara Indonesia University**Abstract**

Breast cancer is one of the most common cancers in women worldwide. The occurrence of breast cancer is very diverse, resulting from the internal and external factors of individuals. Patients diagnosed with breast cancer will experience social, medical, psychological, spiritual, and physical problems, which can affect quality of life. The purpose of this study was to determine the relationship between palliative care and quality of life among patients with breast cancer at Adam Malik Central General Hospital in Medan, Indonesia. This study was a cross sectional study. Eighty-three (83) patients with breast cancer were selected by purposive sampling technique. Quality of life questionnaires for cancer patients, The EORTC QLQ-C30 Indonesian Version 28 item questionnaire and 43-item questionnaire of palliative care were used for data collection to measure the variables. We computed descriptive statistics (frequency, percentage, mean, standard deviation) and performed a Chi-square test for the association between accepting and receiving palliative care and having a good quality of life. The results of this study found that high percentages of patients with breast cancer accepted palliative care (67.5%), and a large percentage of breast cancer patients felt their quality of life was high (89.2%). There was a significant association between accepting palliative care and having a high quality of life of patients with breast cancer ($P=0.001$). Health care providers should promote palliative care to patients diagnosed with breast cancer to increase their perception and quality of life.

Keywords: Breast Cancer, Quality of Life, Palliative Care**Corresponding author:** Rinco Siregar E-mail: rincosiregar@yahoo.co.id

Introduction

Breast cancer is the most common cancer in women worldwide and the cases continue to increase (International Agency for Research on Cancer, 2019). Every year more than 250 new cases of breast cancer out of 4,230,000 new cases of all types of other cancers diagnosed in Europe and less than are diagnosed each year. 175 new cases of breast cancer from 3,792,000 cases of all types of cancer diagnosed in the United States (International Agency for Research on Cancer, 2019).

This breast cancer is one of the leading causes of death of women in the world, including Indonesia (Ministry of Health Republic of Indonesia, 2019). GLOBOCAN data, which is based on a report on the global burden of cancer produced by International Agency for Research on Cancer showed that in 2018, there were 18.1 million new cases with mortality rate of 9.6 million deaths. The implication is that 1 in 8 men and 1 in 11 women in the world experience cancer during their lifetime (International Agency for Research on Cancer, 2019). In Indonesia, there were 58,526 new cases of breast cancer in 2018 (World Health Organization, 2019).

Breast cancer is in the most incidence type of cancer (16.7%) found in Indonesia (Ministry of Health Republic of Indonesia, 2019). According to data presented by the Ministry of Health on January 31, 2019, the breast cancer rate was 42.1 per 100,000 people in the population, with an average death rate of 17 per 100,000 people (Abadi, 2019). The second most prevalent type was cervical cancer of 23.4 per 100,000 people with an average death rate of 13.9 per 100,000 people (Ministry of Health Republic of Indonesia, 2019). The highest cancer prevalence in Indonesia was in Yogyakarta province, which is 4.86 per 1000 people, followed by West Sumatra 2.47 per 1000 people, and Gorontalo 2.44 per 1000 people.

According to data reported several hospitals in Indonesia, breast cancer patients

generally come to hospitals for treatment at an advanced stage of cancer. Over a period of five years (2014-2018), 60.71%, (n=768) of breast cancers were found in the stages of IIIa and IIIb and 7% were even in the stage IIIc. 67.98% of those who were diagnosed with breast cancer were 30-45 years old (Masriadi, 2016), and. Thus, the handling of breast cancer patients at these advanced stages are very complex and requires support from various parties involved. It is estimated that the number of breast cancer patients showing this profile of being diagnosed at late stages will increase every year. Most of the patients at later stages also have poor prognosis, which cause many patients to be unable to survive (Adam Malik Central Hospital Medical Record).

Cancer has major impacts on patients suffering from it physically, psychologically and socially. These factors greatly affect patients' quality of life. Previous studies found that physical (Angraini et al., 2018) changes, psychological changes such as increased depression and anxiety (Nuridah, Saleh and Kaelan, 2019), social functioning, sexual functioning, stage of cancer (Toulasik, Kusumaningrum and Pradanie, 2019) and ability to independently complete daily activities (Putu et al. 2015) affected breast cancer patients' quality of life.

Helping breast cancer patients means increasing the number of patients that are cured and improving the quality of life of patients by using palliative care. (Azis et al., 2008), namely palliative care therapy (Schroeder & Lorenz, 2018; Ministry of Health Republic of Indonesia, 2018). Palliative care is an approach that improves the quality of life of patients and their families facing the problem associated with life-threatening illness, through the prevention and relief of suffering by means of early identification and impeccable assessment and treatment of pain and other problems, physical, psychosocial and spiritual. Palliative care therapy is treatment given to relieve the symptoms and reduce the suffering caused by cancer and other life-threatening diseases. Palliative cancer therapies are given together with other cancer treatments, from the time of

diagnosis, through treatment, survivorship, recurrent or advanced disease, and at the end of life (WHO, 2019).

At Adam Malik Central Hospital, palliative care for breast cancer patients has been carried out. Palliative care includes spiritual activities, social and psychological support or therapy, palliative nurses, anesthesia, nutrition, and providing emotional support/counseling during disease development and mourning process. Since the incidence and mortality rate of breast cancer have increased over time in study area of Medan, Indonesia, the researchers would like to determine whether or not there is a relationship between receiving palliative care and improvement in the quality of life of breast cancer among patients in Adam Malik Central Hospital.

Research Methodology

This cross-sectional study aimed to determine the relationship between receipts of palliative care with the quality of life among breast cancer patients. This research was conducted at the Adam Malik Central Hospital Medan between March and June 2019. The amount of palliative care that a patient received was measured using the Palliative Care Questionnaire (PCQ) scale (Pradana, 2012). The scale consisted of 43 items with each response being rated on a scale of 1- 4 (1=never to 4=always). An English translation of the 43 items used in the questionnaire are included. Higher scores indicate that the patient received a higher level of palliative care. We categorized level of palliative care as "low," "medium," and "high." People living with a life limiting illness whose needs are straightforward and predictable; including families and carers of these people (Level 1; low), people living with a life limiting illness whose needs range from straightforward and predictable to intermediate and fluctuating; including families and carers of these people (Level 2; medium), and people living with a life limiting illness whose needs include straightforward and predictable, intermediate and fluctuating, or complex and persistent; including families and carers of these people (Level 3; high).

Quality of life for breast cancer patients was measured using European Organization for Research and Treatment of Cancer Quality of Life Questionnaire-C30 (EORTC QLQ-C30 Indonesian version). EORTC QLQ-C30 consisted 30 item questions. An English translation of the 30 questions used in the EORTC QLQ-C30 are included. The higher score indicated worse the quality of life. In Part 2 of the EORTC QLQ-C30, there are 2 questions that use somatic deferential with the highest score of 8 and the lowest of 1. For Part 2 or for the entire questionnaire, the higher the score, the worse the quality of life, the lower the score, the better the quality of life. We categorized patient's quality of life as "low" and "high." The EORTC QLQ-C30 quality of life questionnaire has been translated and validated in Indonesian version by Perwitasari et al (2011). It was used with chemotherapy patients at Dr. Sardjito Central Hospital in Yogyakarta.

Study Population and Sample

The underlying population of this study was all breast cancer patients in Adam Malik Central Hospital that were diagnosed with breast cancer from March 2019 to June 2019. Based on review of medical records at the Adam Malik Central Hospital, 499 patients have been hospitalized from March 2019 to June 2019. A total of 83 breast patients were selected using purposive sampling techniques. Inclusion criteria were: 1) Being breast cancer patients with compos mentis awareness (fully aware), 2) being stage III who are undergoing some form of palliative care, 3) being hospitalized as in Rindu B room Adam Malik Central Hospital, 4) and being breast cancer patients who are willing to participate in the study. Our study excluded breast cancer patients who have mental disorders.

Study Design

This study was cross-sectional with the aim to determine the relationship between level of palliative care with the quality of life among breast cancer patients. This research was conducted at the Adam Malik Central Hospital

in Medan, Indonesia between March to June 2019.

Data Collection

Participants spent approximately 45-50 minutes filling out questionnaires measuring palliative care and quality of life. Study staff reviewed the questionnaire to make sure that the participants answered the questionnaire correctly. If the questionnaire was filled out incorrectly, the participant was asked to make appropriate correction. All participants provided written informed consent.

Data Analysis

We used the Chi-square test to analyze the relationship between levels of palliative care received with the quality of life among breast cancer patients.

Ethical Approval

This study was approved by the Health Research Ethics Commission of the Faculty of Nursing, North Sumatra University (Ref.No.1168 / III / SP / 2019). All participants involved in this study provided informed consent to participate.

Results

A total of 83 respondents were recruited and selected based on inclusion criteria. All patients were seen at the oncology inpatient room at Adam Malik Central Hospital Medan. The majority of respondents were above

40 years old (60.2%), and 53.0% were private employees (Table 1).

A high percentage (67.5%) of breast cancer patients reported receiving a high level of palliative care at the Adam Malik Central Hospital in Medan. A high percentage of breast cancer patients (89.2%) also reported having a high level of quality of life.

Table 1. Demographic characteristics, level of palliative care received, and level of quality of life among breast cancer patients in Adam Malik Central Hospital in Medan (n = 83)

Characteristic	N	%
Age (years)		
30-35	6	7.2
36-40	27	32.5
> 40	50	60.3
Occupation		
Unemployed	24	28.9
Private employees	44	53.0
Laborers	6	7.2
Farmers	9	10.8
Level of Palliative Care Received		
Low	1	1.2
Medium	26	31.3
High	58	67.5
Level of Quality of Life		
High	74	89.2
Low	9	10.8

Table 2. The relationship between level of palliative care and quality of life among breast cancer patients at Adam Malik Central General Hospital in Medan (n = 83)

Level of palliative care received	Quality of life level				Total		P-value
	Low		High				
	n	%	n	%	N	%	
Low	1	1.2	0	0.0	1	1.2	0.01*
Medium	6	7.3	20	24.1	26	31.1	
High	2	2.5	54	65.0	56	67.5	

*Chi-Square test (χ^2) Significant at the level of 0.05

67.5% (n=54) of the 83 patients in this study received a high level of palliative care. 65.0% (n=54) of 83 patients have both a high level of palliative care and a high quality of life (Table 2). Of the 56 patients that had a high level of palliative care, 96.4% (n=54) had a high quality of life. The Chi square test statistic for the relationship between level of palliative care and quality of life for breast cancer patients was significant and corresponding p-value was 0.01 ($P < 0.05$). The results of this test show that there was a significant relationship between level of palliative care and quality of life of breast cancer patients. The higher the palliative care received, the higher the quality of life for breast cancer patients was in our study.

Discussion

In the present study, we found that a majority (96.4%) of patients who obtained high level of palliative care also had high level of quality of life. There was a significant relationship between palliative care and quality of life among breast cancer patients at Adam Malik Central Hospital. Based on our observations or from cited literature, breast cancer patients receiving palliative care feel loved, valued by those around them, and got sincere care from nurses. They also accepted the situation of his/her illness and felt ready to accept the effects of his/her illness.

Our study results match research by Irawan and colleagues (2013) that palliative care has an important role for the treatment of patients with terminal illness. Palliative care can be done simply. Its main priority of maintaining the patient's quality of life. The

results of this study also correspond to another study by Anita⁷ and colleagues (2016) which concluded that there is a relationship of palliative care with the quality of life of cancer patients. Likewise, Nazario's research (2014) concluded that there is a relationship of palliative care with the quality of life of patients diagnosed with cancer by helping patients overcome physical, psychological, social and spiritual problems. According to Meier's research (conclusion (2011), it concludes that palliative care and quality of life have a very strong relationship.

Palliative care or integrated care that is active and comprehensive, with integrated multidisciplinary approaches (Matzo & Sherman, 2014), aims to reduce patient suffering, improve quality of life, and also provide support to their families (Rasjidi, 2010). Through palliative care, patients get assistance with physical, psychological, social and spiritual problems (Campell, 2013). The results of this study also correspond with a study by Suranta (2016) which found that those who get high-level palliative care tend to have a good quality of life. It can be concluded by researchers that palliative care has an important role in improving the quality of life among breast cancer patients in the management of pain, psychology, spirituality and others.

Conclusion

From results of this study, it can be concluded that palliative care has a direct relationship with the quality of life of breast cancer patients in the Adam Malik Central Hospital. The higher the palliative care obtained

by breast cancer patients, the better the quality of life obtained.

Research Implication

For nursing education, it is very important to include palliative care in the nursing curriculum. Palliative care can be taught to nursing students so that whenever they treat breast cancer patients, the palliative care services can be given. Finally, breast cancer patients can survive; accept the situation, become stronger and more ready to face the problem of the disease.

Suggestions for the further study

Based on the results of this study, we suggested that future researchers examine the effect of receiving palliative care on quality of life among breast cancer patients in various places in Indonesia.

Acknowledgements

This research was carried out well and cannot be separated from the help of various parties, especially abundant thanks to the University of Sari Mutiara Indonesia for providing moral and material support. Besides that, thank you to the Adam Malik Central Hospital for helping the research process.

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<https://gco.iarc.fr/today/data/factsheets/populations/360-indonesia-fact-sheets.pdf>

*Original article***Environmental Management to Control Behavioral and Emotional Problems in Elderly with Dementia***Received Nov 19, 2019**Revised Apr 4, 2020**Accepted Apr 16, 2020*Fery Agusman MM^{1,*}, Umi Hani¹, Dwi Indah Iswanti²¹Department of Community Nursing, Karya Husada Semarang School of Health Science ²Department of Mental Health Nursing, Karya Husada Semarang School of Health Science**Abstract**

Negative behaviors are the main source of distress for caregivers for the elderly with dementia. Nurses should be trained in managing agitation and other negative behaviors, as well as caring for the emotions of affected patients. Previous studies have identified that various classified behavioral problems may stem from common causes. A universal treatment may be applied according to the features of the syndrome. Therefore, studies are required to highlight the most effective ways of managing behavioral and emotional problems in the elderly with dementia. This study identified research articles regarding the environmental management of behavioral and emotional problems in elderly patients with dementia. A non-systematic literature review was carried out using the PICO (Population, Intervention, Comparison, Outcome) framework utilizing ScienceDirect, ProQuest, SAGE databases in the last 5 years, searching with keywords “elderly, dementia, management, environment, AND caregiver.” The results showed behavioral and psychological symptoms in dementia (BPSD) experienced by the elderly with dementia include agitation, depression, elation, delusions and hallucinations. Environmental characteristics such as light, sound, temperature, color, are important things to consider. Such features can have a positive impact on the dementia patients' physical health, activities of daily living, social relationships and cognitive functioning. A modified sensory room made the elderly have positive energy and raised awareness of the importance of interpersonal relationships. The modifications were fiber-optic lighting, music therapy, aromatherapy, and multisensory stimuli using tactile manipulatives and specific tools for daily live activities. Future research should seek to understand the trends of symptoms over the disease progression to provide proper environment modification and support the caregivers. It is important to identify the environmental modifications that make the most significant impact in reducing negative behaviors of the elderly with dementia.

Keywords: Dementia, Elderly, Environmental management, Negative behavior**Corresponding author:** Umi Hani Karya Husada
Email:umi.hani.ners@gmail.com

Introduction

The behavioral and psychological symptoms in dementia (BPSD) are signs and symptoms of disturbed behavior, mood, thoughts, or perceptions. The International Psychogeriatric Association defined Behavioral and Psychological Symptoms of Dementia (BPSD) as symptoms of disturbed perception, thought content, mood, and behavior frequently occurring in patients with dementia. The BPSD are common problems, which decrease of the quality of life for both patients with dementia and the caregivers. BPSD may include aggression, agitation, wandering, verbal outbursts, delusions, hallucinations, apathy and anxiety. These symptoms can be both problematic and costly. After the onset of disease, more than 80% of demented patients exhibit at least one behavioral and psychological symptom (Huang et al, 2011; Abraha et al, 2017).

Abraha and colleagues (2017) observed that five out of six demented patients, including those living at home, experienced behavioral and psychological symptoms due to their illness. An analysis by Kim and Park (2018) found that patients also had memory loss and reduced cognitive functions in addition to the behavioral problems of dementia. Disorders experienced by the elderly with dementia include agitation, depression, elation, delusions and hallucinations. These symptoms are highly correlated with each other. Twenty percent of people with dementia do not show these symptoms within 2 years of diagnosis of dementia. But 50–80% of patients with clinical symptoms experience agitation within a few months. In addition, at least 50% of patients with dementia present with significant BPSD on a monthly basis.

Agitation is the mismatch of verbal, vocal, and motor activities that are not based on clear necessity or confusion). Agitation may manifest as aggressive or

non-aggressive behavior, as well as physical and verbal and vocal behavior. Of those, inappropriate verbal agitation refers to verbally non-aggressive behavior such as repetitive questions, complaining and attention-seeking behavior, and verbally aggressive behavior such as cursing and screaming. Kim and Park (2018) found that verbal agitation was reported to be more common than physical agitation. Furthermore, the study identified that verbal agitation was caused by hallucinations and physiological discomfort, and pain. These factors were significant predictors of verbal agitation, explaining 27.8% of the variance in the model. Agitation with depression, hinder activities and relationships and cause feelings of helplessness and distress in families and formal care groups. Agitation and depression are strong predictors for poor quality of life as well as nursing home admission.

Approximately 40% of elderly with dementia display aggression due to several risk factors such as depression, pain, caregiver's burden. Aggression also decreases the quality of interaction between caregiver and elderly dementia patient. Hung and colleagues (2017) stated that the severity of BPSD often becomes exacerbated over the course of the disease, and are also associated with caregiver burden.

Dementia is a neurodegenerative syndrome caused by a chronic and progressive disorder accompanied by decreased brain function that affects emotions, memory, decision making, behavior and other brain functions that interfere with daily activities. Dementia is a chronic disease that affects the community. The incidence of Alzheimer's dementia worldwide is increasing rapidly. It is currently estimated that about 50 million people are diagnosed with dementia worldwide, of which 20.9 million live in the Asia Pacific region (Alzheimer's Disease International, 2017).

It is predicted that this number of dementia diagnoses will almost double every 20 years. Around the world, there will be 9.9 million new cases of dementia in 2015. This means that every 3 seconds someone in the world develops dementia.

Indonesia is experiencing an aging population, which projected population is estimated to increase by 10% in 2020, 15.8% in 2035 and 18.4% in 2050. The increase of the elderly population correlates with an increase in life expectancy and improvements in the quality of health services over time. Life expectancy for Indonesians in 2018 was 73.19 years for women and 69.30 years for men, an increase compared to 2017, which was 69.16 years for men while women at age 73.06 year. This shows the success of the national development (Ministry of Health RI, 2018). Life expectancy and increasing number of elderly people also results in an increase in the incidence of geriatric diseases. There is expected to be a rise in conditions like dementia which lead to decreased cognitive function and productivity in the elderly. With no known cure on the horizon, and with a global aging population, every part of society should play an active role in helping to achieve a world where people can live well with dignity with dementia. The prevalence of dementia increases by 1% at the age of 60 years and doubles every 5 years, reaching 30% -50% by the age of 85 years (Soni et al, 2014). Much of the increase will take place in low and middle income countries 58% in 2015, rising to 63% in 2030 and 68% in 2050. The prevalence of dementia in Indonesia reached 1.2 million cases in 2015 and is predicted to increase to 4 million in 2050 (Alzi, 2019).

Increasing prevalence and progression of dementia requires an urgency to develop effective treatments in the management of the elderly with dementia. Impaired cognitive function is usually accompanied by worsening

emotional control, behavior, and also motivation experienced by patients (WHO & ADI, 2012). Prevention of negative behaviors associated with dementia is important. Moreover, the elderly population in Indonesia continues to increase from year to year, which will result in a population structure. Several strategies have been attempted to improve mood, reduce depression, and reduce behavioral disorders. Negative behaviors in the elderly with dementia are triggered by environmental conditions related to the sense of smell, touch, vision. There is no "one size fits all solution" to manage complex symptoms in elderly with dementia. Therefore, the non-pharmacological management approach should be considered (Kales, 2015).

Elderly dementia is often neglected in decision-making efforts for self-care. An environment that provides comfort for the elderly with dementia, especially an environment that supports patients in participating independently in their self-care has many advantages (Handley et al 2015). Handley and colleagues described that environments that are dementia friendly promote independence by being safe to walk around and navigate. We should design environments that are not confusing to elderly with dementia by avoiding shiny floors that can be perceived as water, and by using patterns and colour contrast effectively. Besides that, the environment should minimize distress. One can change or redesign existing physical spaces, add of physical objects to environment, and modify the type of living environment. This intervention decreases behavioural and psychological symptoms of dementia (Soril et al, 2014). Environmental aspects greatly impact the caregivers who accompany the elderly with dementia. Families and caregivers need to be involved in designing comfortable spaces that minimizing the pressure in caring for the elderly with dementia.

This literature review aims to provide an overview of the effectiveness of environmental management to control negative behaviors that might arise in the elderly with dementia.

Research Methodology

Briefly, to obtain the evidence regarding the environment modification, we first identified published, peer-reviewed research articles using a non-systematic search across several databases. After processing eligible studies, we identified and obtained primary studies from these published research papers to generate the compendium of papers about environment management of behavioral symptoms of elderly dementia patients. . We developed a narrative summary and a thematic synthesis to synthesize the quantitative and qualitative data, respectively. We conducted third synthesis to combine the previous two syntheses. No protocol existed for this non-systematic review. This research did not involve participation of human subjects, thus research ethics board review was not required, nor was informed consent.

Search strategy and inclusion criteria for systematic reviews

The literature review was performed using the PICO Literature Review (Table 1) framework within ScienceDirect, ProQuest, SAGE, DOAJ (Directory of Open Access Journals) databases in the last 5 years, with keywords elderly, dementia, agitation, management, AND environment, caregiver. The keywords were also changed to synonym keywords such as ageing, senile dementia, negative behavior. Reviews were also carried out on abstracts and references from articles collected.

Titles and abstract of manuscript were assessed for relevance to the topic using the following inclusion criteria:

- 1) Empirical quantitative, qualitative, or mixed-methods studies published in peer-review journals between 2015-2019, written in English;
- 2) Study participants were clinically diagnosed with dementia
- 3) Intervention approaches were within the scope of environment stimulation
- 4) The impact of environmental management on negative behaviors of people with dementia was measured;

Table 1. Description of PICO Literature Review

P	Patient, Population, Problem	Dementia, Elderly
I	Intervention	Environment modifications
C	Comparison Intervention (if appropriate)	NA
O	Outcome to Measure or Achieve	Patient's Negative Behavior

If relevance was not clearly evident based on the initial review, the full article was read to determine whether it should be included. Once the initial group of articles was gathered, the full texts were read to ascertain final inclusion in the review. Eight articles met the inclusion criteria. Data were extracted into a Journal Citation Report to review study characteristics and rate levels of evidence for each article. We conducted an analysis of the research articles identified using the PICO framework.

Study Selection, Data Extraction and Management

From each full-text, we collected the data about the publication year, the databases searched, the study population, the environment modifications. The authors independently screened titles, abstract, and full texts of articles. The authors retrieved full-text versions of potential articles and determined final inclusion in the review on the basis of relevance to the question, study quality, level of evidence, and inclusion and exclusion criteria. Disagreements were resolved by discussion or by consulting another author if necessary.

Each retained article was appraised and key information extracted to an evidence table that provide a summary of the methods and findings of the article. Supplemental table summarizes the characteristics, including methodology,

environmental modification assessed, result, and recommendation.

Risk of bias assessment and grading the quality of evidence

The risk of bias of each study was not evaluated. The overall quality of evidence was not assessed. Results regarding the risk of bias and grading the quality were resolved through discussion.

Outcome measures

We focused on articles that considered negative behaviors in-patient with dementia as a primary outcome.

Results

Study Selection

A total of 802 citations and abstracts were screened during the initial search. 171 records were excluded in the abstract review and 16 were assessed in full-text. Eight articles were excluded following full-text review and ultimately, eight studies were included in the final analysis. (Figure 2)

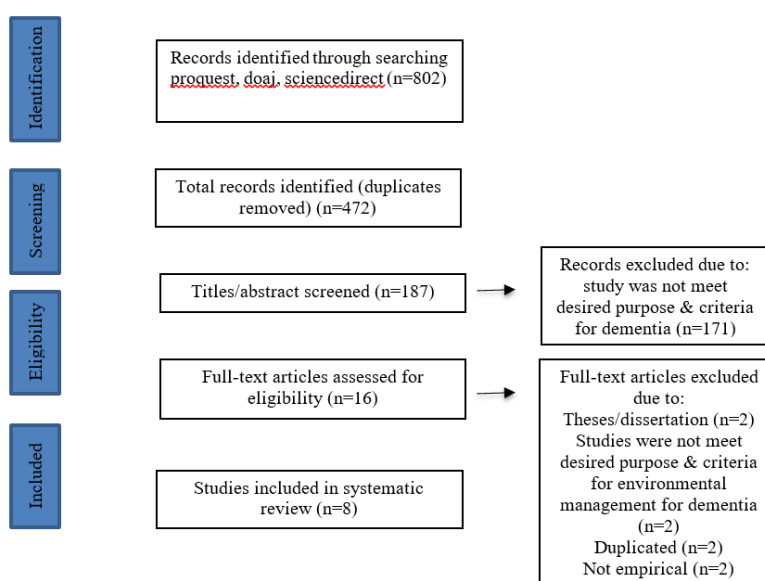


Figure 2. PRISMA Flow Diagram of Included Studies

Characteristics of Included Studies

Five studies used quantitative study designs including cross sectional, survey, and quasi non-experimental study designs (Houston, 2015; Morante, 2017; Evan et al, 2019; Baurtrant et al, 2018; Lee et al, 2016). Two studies used descriptive phenomenological study designs (Brooke & Semlyen, 2019; Tsai and Hong, 2019) and one study used mixed method design (Leung et al, 2019).

Negative Behavior of the Elderly with Dementia

Agitation and negative behaviors including aggressive and perseverative types occur in up to 50% of patients with advanced dementia and 36% of patients with newly manifested disease. Dementia patients in the final phase experience some agitation behavior every week, including 18% experiencing anxiety and 10% of displaying verbal aggression. Agitation in elderly patients with dementia is a major problem that causes distress to families, nurses, and direct caregivers (Houston, 2015; Morante, 2017). For people living

with dementia, the symptoms they experience can have a significant impact on their confidence and ability to continue to lead an independent and full life (Evan et al, 2019). Thus, it was important to increase the skills and confidence of professionals involved in the patients' care. People with dementia who live in their own homes also face multiple challenges due to a deterioration in their physical and cognitive abilities.

Environmental management

Evan and colleagues (2019) suggested that relatively inexpensive aids could contribute towards the maintenance of wellbeing for people with dementia in domestic settings. These aids help to minimize disruption and anxiety for people living with dementia. The five aids that were reported to be the most beneficial were dementia clock, noticeboard/whiteboard, touch-activated beside light, key locator and memo minder. These helped people with dementia continue to live at home with a good quality of life. The study stated the

benefits of these aids spanned three main areas: (1) Promoting independence and quality of life for people with dementia and their family caregivers; (2) The skills and confidence of professionals involved in the project; (3) Strengthening partnerships between the collaborating organizations across health, housing, and social care.

In their study, Baurant and colleagues (2018) found that Behavioural and Psychological Symptoms of Dementia (BPSD) prevalence can be reduced by making simple environmental rearrangements to improve spatial and temporal orientation. The rearrangements were sky-like ceiling tiles in part of the shared premises, progressive decrease of the illuminance at night together with soothing streaming music, reinforcement of the illuminance during the day. Environmental modifications also included painting the walls light beige, placing oversized clocks in corridors, and wearing different colors based on time of day (ie. Dark blue at night time and sky blue during the day).

The environmental changes were also studied by Brooke & Semlyen (2019) across three wards within a District General Hospital (DGH) in England. The hospital made extensive changes in each ward to make the environment less clinical, appear more warm and friendly, and to support interactions with both patients and their families. The environmental changes impacted on the care staff in two ways. First, the changes provided hospital staff with more options to care for people with dementia. Second, the changes created an environment where hospital staff were closer to their patients throughout their working shift. Dementia friendly wards are an important and impactful way to improve care and the lived experience of people with dementia

in the acute hospital setting. These changes can reduce confusion and create a supportive space. The implementation leads to increased contact with patients, and increased patient-centered care, and possibly a reduction in harm. The busy and noisy environment with a large number of healthcare professionals caring for a patient has negative impacts on patients with dementia. This environment may increase agitation, confusion and distress, reduce patient mobility and social interactions, and could lead to higher risk of further health complications.

In another study, Lee and colleagues (2016) had suggested that a smaller, home-like environment supports eating and drinking, makes dining more enjoyable, and thereby promotes favorable nutrition outcomes. Elderly with dementia can more socially active and more engaged with others in an optimal environment. A smaller home-like environment may also offer a sense of comfort, security, and belonging. This study found that a smaller home-like environment was associated with a higher level of positive mood, social engagement, physical functioning, and better health status compared with residents with dementia living in the traditional large-scale unit. The home-like environment included a relatively short corridor (approximately 14 m long), all single bedrooms, and a single-loaded floor plan. The number of staff working in the daytime in this environment was 1.5 nurses and two care aides.

Houston (2015) found that a Multisensory Stimulation Environment (MSSE) was mildly effective for agitation and negative behavior. In this study, the MSSE was created from a room approximately 12 feet x 12 feet that was previously used as an office. The research was conducted in an assisted living facility

with a secure residential dementia care unit referred to as Dementia Care Unit (DCU) for elderly patients with moderate to severe dementia in Vermont, United States. The room contained a range of features for multisensory stimulation including visual, auditory, olfactory and tactile needs. The visual stimulation included handheld toys of colored bubbles and moving sand; simple abstract artwork; soft indirect lighting provided by floor lamps; and a deep forest green wall color different from the creamy yellow color of the rest of the unit. Olfactory stimulation was provided by eucalyptus stalks. Tactile stimulation was provided by soft, furry fabric swatches on the arms of the overstuffed chair and sofa. Auditory stimulation was provided by a sound machine playing a variety of sounds from nature such as waterfall and ocean waves. Another study by Morante (2017) found that group music therapy for eight weeks had the potential to decrease agitation of dementia patients lived in nursing home. After patients in the DCU visited the MSSE for approximately 10 weeks, the caregiving staff gave their appraisal about the MSSE with MSSE Staff Appraisal Survey (MSSE-SAS). The MSSE appeared to be more effective for anxiety type behaviors and less effective for psychotic symptoms and physical needs such as pain relief and sleep disturbance.

The multisensory stimulation environments were also studied by Tsai and Hong (2019) in their qualitative study. In their study, multisensory-stimulated environments were effective in slowing cognitive deterioration and achieve physical and mental recovery. Many empirical studies have shown that a positive design for those with dementia can be assisted by a pleasant physical environmental design, and supportive spatial features, such as a direct moving

line system. The physical environment should be visually accessible, that is, meaningful integration should be implemented.

Environmental characteristics such as lighting, sound, temperature, color, and mode are all important. The sensory room in this study made the elderly people with dementia feel positive emotions on the psychological level. It also helped elderly people with dementia realize the importance of interpersonal friendship and environment. This study believed that multisensory environmental characteristics could alleviate the symptoms of the elderly. It pointed out that one could add playing games and learning. It also noted that the most important indicators are safety and personality. One of the most basic concepts is that safety should reflected in indoor planning and design. Space configuration should be further discussed with relevant experts in the planning process.

The unique personality or individuality of each elderly person with dementia should be considered when designing the environment. The patient should be given the autonomy to choose the sensory environmental stimuli they need. The appropriate sensory stimulation also needs to be managed by the caregiver based on the needs and background of each senior patient. So different sensory stimuli may given to each patient. To create a healing environment, indoor spatial planning should not only be physiologically safe for the elderly, but also promote a psychologically stable existence. This kind of environment was also studied by Leung and colleagues (2019). This study investigated the effects of indoor built environment (IBE) on the quality of life (QoL) of the demented elderly. The model confirmed that the building services factors, such as lighting,

temperature, lifts and water supply, predicted demented elderly residents' physical health, psychological health, independence, activities of daily living and social relationships. Besides that, supporting facilities factors such as signage, finishes and furniture, also exert a positive impact on the residents' physical health, activities of daily living, social relationships and cognitive functioning. Practical recommendations were made, including that homes provide access to a sky garden on each floor, label water taps with hot and cold signs, provide signage with iconic information at different strategic locations, employ color contrasting finishes in different rooms, use historical furniture, and so on. This study's results provide valuable insight into improving C&A homes' IBE in order to enhance the QoL of the demented elderly.

Discussion and Conclusions

A caregiver's attitude towards the elderly with dementia has an impact on the condition of the elderly patient. An essential phenomenon to consider is that the family member who is the elderly dementia patient's caregiver fears losing self-identity. There are six components of this phenomenon including: 1) feeling of the effects of aging due to memory deficit, 2) continuous comparison of the family member's behaviour with that of the participant's, 3) finding it painful to see a family member with dementia as he/she does not know how this will end, 4) not knowing the conclusion of the disease process, 5) reducing the risk of dementia, and 6) trying to change one's lifestyle from what it used to be in the past (Kim et al, 2016).

Environmental characteristics such as light, sound, temperature, and colour are important things to consider. Indoor built environment gave a positive impact on the

residents' physical health, activities of daily living, social relationships and cognitive functioning (Leung, Wang, & Chan, 2019). The study showed that some indoor BE components can enhance the QoL of the elderly. Furniture and fixtures affected all the personal QoL domains (physical and psychological health, the social relationship and overall QoL). For example, a wardrobe that is too high or too deep made it difficult for the elderly patient to perform their daily activities (e.g. picking dresses). This obstacle induced negative feelings and subsequently affected their self-esteem.

Color and lighting significantly and positively affected on the patients' social relationships. The functionality of elderly patient's eyesight declined normally due to ageing. This loss of vision increased the risk of falling and collision within their residence. The windows are normally allocated on the one side of the unit flat, which limits uniform illumination of the elderly residence and affected daytime lighting. Thus, installation of artificial lighting played an essential role for assisting elderly impaired vision and creating a pleasant environment for social interaction. Color was also an important component significantly influencing social relationships among the elderly. Poor combination of colors in the environment of elderly further compounded their visual impairment, and consequently led to personal detachment and reduced participation in the neighborhood. Thus, the color designs helped the patient to overcome sensory deprivation and provided visual stimulation for social interactions. The right mix and combination of colors with good luminous contrast or density could prevent eye fatigue, raise visual acuity and also created a warm environment and pleasurable atmosphere for neighbors or visiting

friends. Warm colors with high illumination encouraged alertness and aided the orientation of the elderly. Some colors were useful in alerting the elderly to their surroundings. The preferred colors were blue, red, green, and yellow.

Modified rooms made the elderly have positive energy and raised awareness of the importance of interpersonal relationships. Tsai and Hong (2019) stated that the process of interaction between the elderly and the sensory environment changed the attitudes of the elderly from being passive to being active participants. The multisensory environment can be developed as a method of healing. Sensory room includes six indicators namely accessibility, environmental support, diversity, safety, interactivity, and autonomy.

Multisensory stimulation is based on the principle that dementia patients suffer from an imbalance of sensory stimulation. MSSE is an alternative sensory experience from the usual environment (Kim et al, 2016). Care for the elderly requires a comfortable and relaxed environment to prevent social isolation and strengthen self-resilience. This can be created with the design of a physical environment and supporting spaces such as moving line systems and improving visually accessibility.

A sensory room is an environmental modification for the elderly with dementia that provides psychological support to improve interpersonal relationships. Modifications in sensory rooms include aspects of light, sound, temperature, and color. Sensory activity in the sensory space creates softer communication and closeness between the elderly and caregivers. The sensory room supports the elderly patients to explore the sensory environment freely and adjusts to

the mood and physical strength of the elderly.

Dementia patients who live in small-scale care units, such as home care, will show a more positive mood, social involvement, physical function, and better health status compared to residents with dementia who live in large-scale units. Overall, current research findings indicate that small-scale facilities have a positive effect on the health and behaviour of patients (Lee, Chaudhury, & Hung, 2016). Research showed that building facility factors (lighting, temperature, elevators and water supply) predicted the physical health of the elderly, psychological health, independence, activities of daily living and social relations.

In addition, supporting facilities such as signage, finishes and furniture also have a positive impact on the physical health of the elderly with dementia, daily life activities, social relationships and cognitive functions (Leung, Wang, & Chan, 2019). Morante (2017) also revealed that music therapy in the home nursing has the potential to decrease agitation among dementia elderly patients suffering agitation. It is a cost effective approach in managing dementia symptoms of elderly patients.

This literature review provides a detail and up-to-date picture of the negative behavior of the elderly with dementia. Hallucinations, physiological discomforts, and pain need to be a concern when providing interventions to control verbal agitation in patients with dementia. This review also looks at current evidence about the effects of environmental modification to control or reduce the negative behaviors of the elderly with dementia. Experts believe that environmental modification with multisensory characteristics can relieve symptoms in the elderly. These

modifications can solve negative behavioral problems for experienced by both the patients and the caregiver. Therefore, sensory stimulation is not only about feelings, but also about what makes the elderly and the caregiver learn new things and agree on a sense of achievement.

Recommendation

Future research needs to understand the trends of symptoms over the disease progression to provide proper environment modifications to aid the patients and caregivers. It is necessary to continue to examine which environmental modifications have the most significant impact on controlling specific negative behavior of the elderly with dementia.

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Original article

Practice in Oral Health Care and Dental Caries Prevalence among the Village Health Volunteers in Warin Chamrap District, Ubon Ratchathani Province, Thailand

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Panawat Kingmala¹, Chalinee Phasunon¹, Thanatta Kaewkanya²,
Watcharapong Benmat¹, Ampika Phoban¹, Kaewjai Maleelai¹,
Wanpen Somhom¹

¹Sirindhorn College of Public Health Ubon Ratchathani, Ubon
Ratchathani Province, Thailand

²Maisamakkee Primary Health Promoting Hospital, Selaphum District,
Roi-et Province, Thailand

Abstract

Improving dental health care is an important priority for Thailand. According to the 8th oral health survey in 2017 by Thai Bureau of Dental Health, the prevalence of dental caries was 91.8 % in a nationwide study of people 35-44 years old. The average number of decayed, missing, and filled tooth (dmft) was 6.6. Primary healthcare is a public health service that provides services at the subdistrict and village. Promoting oral and dental health is important to prevent dental caries, reduce the cost of treatment, and prevent loss of permanent teeth. The Village Health Volunteers (VHVs) play an important role in primary dental health care by leading changes in health behavior and by integrating public health work with local government organizations. This cross-sectional descriptive study aimed to study oral health care practices and the prevalence of dental caries among the village health volunteers in Warin Chamrap district, Ubon Ratchathani province. 155 VHVs were recruited in the Warin Chamrap district, Ubon Ratchathani province using a random sampling method. Data were collected by the questionnaires and dental health status examinations form. The results showed that 69.68% of VHVs practiced oral health care at a moderate level ($\bar{x}=2.99$, S.D.=0.35). VHVs had an 80% prevalence of dental caries. The average number of dmft was 7.98, which is slightly higher than the Thai national average. The results of this study may be used for dental service planning and dental health promotion, and to encourage VHVs to be good models of oral health care.

Keywords: Practice in oral healthcare, dental caries, village health volunteers

Corresponding author: Kaewjai Maleelai; Email: kaewjai@scphub.ac.

Introduction

According to the report of the 8th oral health survey in 2017 by the Bureau of Dental Health, Department of Health, Thai Ministry of Public Health, the national prevalence of dental caries of Thailand was 91.8 % among 35-44 year olds. The average number of decayed, missing and filled teeth (dmft) was 6.6 teeth per person. 4.1 % of the “working-age group” (35-44 years old) population had tooth decay at root cavities. The prevalence of root decay was 4.7 % in a rural area, 3.9% in urban area, and 1.7 % in Bangkok. In rural areas, there was a high percentage of people who needed treatment services. 44.2 % of people who needed to fill tooth caries. 31.4 % of people needed tooth extractions. The northeastern region has the highest percentage of patients (48.0%) that need tooth fillings on one side. In the northeastern region, 72.0% of the working group (35-44 years old) reported never brushing teeth after breakfast. 76.2 % reported never brushing teeth after lunch. 6.7 % reported brushing before bedtime and going to bed immediately after brushing teeth. 4.9 % reported never brushing teeth before bedtime. 4.7% reported brushing teeth someday before bedtime and continuing to eat after brushing. 7% reported brushing teeth someday before bedtime and later going to bed. (Department of Health, 2018).

In Thailand, primary health care means providing health care for the people at the district level. Village communities participate in helping people care for themselves using technology and local wisdom able to solve public health problems within a village or community with self-sufficiency. Government officials provide assistance and support so that the community can connect with the public health service system efficiently (Department of Local

Administration, 2017). People who play an important role in primary health care are Village Health Volunteers.

The Village Health Volunteers (VHVs) are people who selected from the village community that receive training following the curriculum set by the Ministry of Health. They have important roles as leaders in health behaviour change (Change Agents). They are responsible for creation of media to communicate public health news. They disseminate health knowledge, as well as plan and coordinate health activities. VHVs also provide various health services in the community such as health promotion surveillance and prevention of disease control. They organize public health development activities in villages/communities (Department of Local Administration, 2017). VHVs are close to the people, and are considered important and respected leaders. They provide health services, act as community health planners, and integrate public health work with local government organizations. VHVs can help communities reach goals of having a health and happy society by linking to the district health fund and other funds, inside and outside the community (Sarak M, 2010).

To our knowledge, there have been no previous studies on practice in oral health care and dental caries prevalence among the village health volunteers in Warin Chamrap district, Ubon Ratchathani province. The results of this study can be applied to plan oral health promotion or dental health education program to encourage VHVs to be good models of oral healthcare. The objective of this study is to examine the oral health care practices and prevalence of dental caries among the Village Health Volunteers in Warin Chamrap district, Ubon Ratchathani province, Thailand.

Research Methods

This study was a cross-sectional descriptive study. There were 253 village health volunteers under the Municipality of Muang Si Khai and Tat sub-district, Warin Chamrab district, Ubon Ratchathani Province in 2017. There were 135 VHVs in the Tat sub-district health service area and 118 VHVs in Muang Sri Khai sub-district. The inclusion

criteria for this study was that the VHV had at least 1-year working experience as a VHV. The exclusion criteria included the volunteer not showing up for an appointment with the research study twice. To determine the necessary sample size for our study, we used the following formula.

$$n = \frac{NZ^2pq}{d^2(N-1) + Z^2pq}$$

n = sample

N = population

d = sample error (0.05)

Z = the standard value at the significant level 0.05 equal to 1.96

P = the population proportion of interests (set p=0.80)

Based on our calculation, the desired sample size was 125 persons. To account for the fact that some participants may drop out or be lost to follow-up, we increased the sample size by 10 per cent. Our study participants were randomly selected from the 253 village volunteers using a simple random sampling technique. One hundred and fifty-five VHVs were selected for our study.

The questionnaire consisted of two parts as follows. Part 1 was about the demographic characteristics and work experience of the participants (7 questions). Part 2 was about the oral healthcare practices of participants (11 questions). Study staff recorded the number of dental caries using dental health status examinations form.

The ethics of the study was approved by the Ethics Committee of Sirindhorn College of Public Health, Ubon Ratchathani (No. SCPHUBS024/2559).

We tested the content validity of our questionnaire with three experts. We also

tested the reliability of the questionnaire among 30 people. Reliability of practice in oral healthcare measured by Cronbach's alpha coefficient was 0.95. We also tried to account for variation among different inspectors. We adjusted for a single inspector standards using Intra - Examiner Calibration. We also adjusted for variation in standards among more than one the inspector and adjusted for variation among multiple inspector standards (Inter - Examiner Calibration). We calculated the Kappa statistic to determine the validity of the inspector. The Kappa statistic was 0.8 - 1.00 (80% - 100%). The interpretation level of practice in oral health care dividing into 3 level. High level of practice in oral health care (score average 3.68-5.00). Moderate level of practice in oral health care (score average 2.34-3.67) and low level of practice in oral health care (score average 1.00-2.33) respectively.

Results

Part 1 Characteristics of Sample

The demographic characteristics of the 155 VHVs that participated in our study are shown in Table 1. Most of village health volunteers were female (85.20%). The majority of the village health volunteers were aged 51 to 60 years old (38.10%) or 41-50 years old (34.90%). Most of the village health volunteers' graduated from elementary school (52.30%), followed by secondary school (25.20%), and high school /vocational high school (20.0%). A majority (85.2%) of VHVs were married (85.2%).

The most common primary occupations for VHVs were in agriculture (60%), as housewives (15%), as general contractors (10.3%), and in the trade/personal business (9.7%). The VHVs had a variety of different years of experience including 10 to 19 years (34.80%), followed by during 4 to 9 years old (32.90%), and less than 4 years (16.10%). Most village health volunteers were selected by villagers/village councils (54.80%), were recruited by volunteering themselves (25.20%), or were recruited through health promotion workers (14.80%).

Table 1. General characteristics of Village Health Volunteers in the Warin Chamrap district, Ubon Ratchathani province, Thailand (N=155)

General characteristics	Number	%
Gender		
Male	23	14.80
Female	132	85.20
Age		
< 30 years	4	2.40
30 – 40 years	19	12.40
41 – 50 years	54	34.90
51 – 60 years	59	38.10
> 60 years	19	12.20
Highest level of education completed		
Primary school	81	52.30
Junior high school	39	25.10
High School/ Vocational	31	20.00
Certificate of Education (High Vocational Certificate)	2	1.30
Bachelor's degree	2	1.30
Status		
Single	11	7.10
Married	132	85.20
Divorced	12	7.70
Career		
Agriculture	93	60.00
A worker in a factory	6	3.90
Private /Business	15	9.70
A labor worker	16	10.30
Housewife	24	15.5
Other	1	0.60

Table 1. General characteristics of Village Health Volunteers in the Warin Chamrap district, Ubon Ratchathani province, Thailand (N=155) (Cont.)

General characteristics	Number	%
Years of work experience as a VHV		
<4 years	25	16.10
4 - 9 years	51	32.90
10 - 19 years	54	34.80
20 - 24 years	13	8.40
25 - 29 years	8	5.20
>30 years	4	2.60
How participant qualified as a village health volunteer		
Offer themself	39	25.20
Health Promotion Team	23	14.80
Villager / village council	85	54.80
Other	8	5.20

Part 2 Self-Reported Oral Healthcare Practices among Village Health Volunteers

In Table 2, we show the self-reported oral health care practices of VHVs in our study. A majority of VHVs regularly used toothpaste containing fluoride when brushing (51.6 %). VHVs reported acting as a good role model in dental health care either regularly (42.6%) or often (34.8%). 20.6% of VHVs regularly demonstrated how to brush their teeth correctly for their community members. 46.5% of VHVs sometimes visited homes and made oral healthcare recommendations. VHVs reported that they examined the oral health of people in the community roughly either sometimes (40%) or once in a while (20.6%). 34.8 % of VHVs often followed news about dental health. 44.5% of VHVs

sometimes sought new knowledge about dental health. 29% of the VHVs often recommended that people in their community should eat food at specific times, and not eat little by little throughout the day. VHVs reported setting up a board to provide knowledge about harmful foods and benefits for dental health either once in a while (22.6%) or never (34.6%). VHVs recommended that people in the community choose hygienic accessories such as dental floss either sometimes (25.2%) or once in a while (34.6%). A majority of VHVs (58.60%) had never used erythrosine solution or food coloring from the Pharmaceutical Dyeing Organization to check for tooth plaque after brushing.

Table 2. Self-Reported Oral Healthcare Practices among Village Health Volunteers in the Warin Chamrap district, Ubon Ratchathani province, Thailand (N=155)

contents	Number reporting specific frequency of oral health care practice (%)				
	Regularly	Often	Sometimes	Once in a while	Never
1. You are a good role model in oral health care	66 (42.6)	54 (34.8)	24 (15.50)	9 (5.80)	2 (1.30)
2. You visited homes and recommended oral health care	19 (12.26)	36 (23.23)	72 (46.45)	18 (11.61)	10 (6.45)
3. You sought new knowledge about dental health	24 (15.50)	41 (26.50)	69 (44.50)	16 (10.30)	5 (3.20)

contents	Number reporting specific frequency of oral health care practice (%)				
	Regularly	Often	Sometimes	Once in a while	Never
4. You have examined the oral health of people in the community roughly	14 (9.00)	39 (25.20)	62 (40.00)	32 (20.60)	8 (5.20)
5. You use toothpaste that contains fluoride to brush your teeth	80 (51.60)	37 (23.90)	30 (19.40)	5 (3.20)	3 (1.90)
6. You demonstrated how to brush your teeth correctly in the community	32 (20.6)	35 (22.6)	50 (32.30)	22 (14.20)	16 (10.30)
7. How often do you use dental dyes (erythrosine solution) or food dyes from the Pharmaceutical Organization to check for plaque after brushing?	5 (3.20)	20 (12.90)	23 (14.80)	17 (11.00)	90 (58.60)
8. You recommended that people in the community choose hygienic accessories such as dental floss	9 (5.80)	16 (10.30)	39 (25.20)	29 (18.70)	62 (40.00)
9. You set up a board to provide knowledge about harmful foods/benefits of dental health	10 (6.50)	17 (11.00)	40 (25.80)	35 (22.60)	53 (34.20)
10. You recommended that people in the community eat food for a time and not eat it	19 (12.30)	45 (29.00)	58 (37.40)	16 (10.30)	17 (11.00)
11. You follow the news about dental health	28 (18.10)	54 (34.80)	46 (29.70)	20 (12.90)	7 (4.50)

Table 3 shows the distribution of VHVs among different levels of practice in oral health care, including low, moderate, and high. A majority of VHVs (n=108, 69.68%) demonstrated oral health care at a moderate

level (\bar{x} =2.99, S.D.=0.35). Thirty-five of VHVs (22.58 %) practiced oral health care at a high level (\bar{x} =4.05, S.D.=0.29). Twelve of VHVs (7.74%) practiced in oral health care at a low level (\bar{x} =1.98, S.D.=0.28). (Table 3)

Table 3. Level of practice in oral health care among village health volunteers (N=155)

Level of Practice in Oral health care	Number	%	\bar{x}	S.D.
High	35	22.58	4.05	0.29
Moderate	108	69.68	2.99	0.35
Low	12	7.74	1.98	0.28

Part 3 Dental caries and decayed, missing, filled tooth (dmft) among village health volunteers

Table 4 shows the distribution of decayed, missing, and filled teeth, as well as the prevalence of dental caries among VHVs in our study. 80% of VHVs showed dental caries. The

average number of decayed, missing, filled teeth (dmft) in VHVs was 7.98 dmft/person. (Table 4)

Table 4. Number, percentage and decayed, missing, filled tooth (dmft) of dental caries among village health volunteers (N=155)

VHVs With No Dental Caries	VHVs with Dental Caries	Decayed, Missing, Filled Teeth (dmft)			Average of Decayed, Missing, Filled Teeth Per Person
Number (%)	Number (%)	D	M	F	
31 (20)	124 (80)	668	473	96	7.98

Discussion

We found that most of the VHVs (69. 68%) practiced oral health care at a moderate level (\bar{x} =2.99, S.D.=0.35) in the Warin Chamrap district, Ubon Ratchathani province, Thailand during November and December 2017. While, Chaichanapong and Pinitsootorn show differences with our study's findings. They were studied the knowledge, attitude and behaviour in preventing dental caries of public health volunteers in Mueang District, Nong Bua Lamphu Province. Chaichanapong and Pinistsootorn's study objective was to investigate the knowledge, attitude, and practices in preventing dental caries of public health volunteers in Mueang District, Nong Bua Lamphu province in 2015. The research found that VHVs volunteers had a fair level of knowledge about preventing dental carries. Only 20.90% of the VHV respondents had good attitudes and correctly perceived that brushing could prevent caries and periodontal disease. The VHVs understood how extracting teeth with necrosis resulting from betel nut chewing can prevent tooth decay (Manasanan C. & Somdej P., 2014).

The prevalence of dental caries among VHVs at Warin Chamrap district, Ubon Ratchathani was at 80 %. The average dmft was 7.98 teeth/person. In our study, VHVs represented a: 51 to 60 years old (38.10%), 41 to 50 years old (34.90%), a 30 - 40 years old (12.40%), over 60 years old (12.20%) and under 30 years (2.40%) respectively. The dental caries prevalence among VHVs in our study was lower than the dental caries prevalence on a national level in Thailand (91.8%) and among North Eastern Thai populations (88. 6%) . However, the data for the national level and

the North Eastern Thai populations is for working- age individuals from ages 35- 44 years old. The average dmft among VHVs in our study (dmft = 7.98) was higher than the average dmft on a national level in Thailand (dmft = 6.6) and among North Eastern Thai populations (dmft = 5.4) (Department of Local Administration, 2017). The prevalence of dental caries for the national level and North Eastern Thai populations.

The practice in oral health care among VHVs at Warin Chamrap district, Ubon Ratchathani province was mixed and can be improved. A little over half (51.6%) of VHVs usually used a toothpaste containing fluoride when brushing. Yet, 60.0% of VHVs never used dental floss . Without good brushing practices, some VHVs may have been unable to remove food debris or plaque from the teeth resulting in cumulative dental caries. VHVs in our study had a higher prevalence of dmft than the Thai people of the working-age group (35-44 years old) on a national level. While a large portion of VHVs demonstrated how to correctly brush teeth in the community regularly (20.6%) and often (22.6%), 32.30% of VHVs only sometimes performed demonstrations about how to correctly brush teeth to the community. Only 18.10% of VHVs regularly followed dental public health news. These shortcomings may have resulted in a relatively high level of tooth decay among VHVs in our study. VHVs played a role as good dental health care which is operating 42.6 %. These behaviors will lead VHVs to good at dental health care and act as a good role model for the community.

Previous research showed that dental health education programs can help prevent

dental caries. Arunrat and colleagues applied the motivation theory for disease prevention and social support to change dental caries preventive behaviours of VHVs. Then Arunrat and colleagues measured the effects of the dental health education program on knowledge of VHVs. The results showed that the experimental group had mean scores of knowledge and practice for dental caries prevention that were significantly higher than before receiving the dental education program and higher scores than the comparison group ($p < 0.001$) (Chuenpalat A, 2017). A different study by Suttawat examined the effect of the dental health education program to solve dental health problems in the community served by the village health volunteers in Pho Yai Subdistrict, Warin Chamrap District, Ubon Ratchathani Province. This study found that the dental health education program significantly increased the positive oral

Conclusion

A majority of VHVs were female (85.2%). The age of VHVs ranged from 24 to 67 years old. Most of VHVs completed primary school (52.3%), were married (85.2%) and worked in the agricultural industry (60%). Slightly more than one-third of VHVs (34.8 %) worked as VHVs between 1 -19 years. A majority (54.8%) of VHVs were selected by villagers/village councils. A one hundred and eight of VHVs (69.68%) practiced oral health care at a moderate level ($\bar{x}=2.99$, $S.D.=0.35$). 35 VHVs (22.58%) had practice in oral health care at a high level ($\bar{x}= 4.05$, $S.D.=0.29$). Only 12 VHVs (7.74%) practiced in oral health care at a low level ($\bar{x}= 1.98$, $S.D.=0.29$). Dental practiced well of VHVs were regularly

health care practices among VHV ($p < 0.05$) (Srisombat S., 2016).

The results of this study can be applied to dental service planning. It can also be used to design dental health promotion messages that encourage VHVs to be good models of oral health care. The relevant government agencies for dental health should encourage VHVs to improve their knowledge of dental health care. They can provide VHVs with courses on how to properly brush teeth or how to use dental floss. Dental health education programs can help prevent tooth decay among VHVs. If VHVs have good dental health care and strong knowledge about dental health, they can advise and educate their community. As a result, VHVs and people of their community can have better dental health without fewer or no dental caries.

brushed their teeth with fluoride toothpaste (51.60 %) and demonstrated how to brushed their teeth correctly with their community (20.6%). VHVs (58.60%) never used dental dyes (erythrosine solution) or food dyes from the Pharmaceutical Organization to check a plaque after brushing and VHVs (40 %) never recommended people in their community used dental floss after brushing. Dental practiced that VHVs never practiced needs to in improvement influence the design of future dental education programs for VHVs. A one hundred and twenty four of VHVs (80%) had dental caries at the time of this study. The average number of decayed, missing, filled teeth (dmft) was 7.98 teeth/person.

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Original article

The Effectiveness of Family-Based Intervention for Improving Glycemic Control in Patient with Diabetes Melitus Type 2

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Ni Kadek Diah Purnamayanti ¹, Gede Budi Widiarta^{2*}
I Dewa Ayu Rismayanti ³, Pisit Poltana ⁴, I Made Sundayana⁵

¹ Department of Medical Surgical Nursing, STIKES Buleleng, Indonesia;

² Department of Pediatric Nursing, STIKES Buleleng, Indonesia

³ Doctorate degrees in Nursing Student, Universitas Airlangga, Indonesia;

⁴ Director of Boromarajonani College of Nursing Suphanburi, Thailand;

⁵ Director of Health Education, STIKES Buleleng, Indonesia

Abstract

Diabetes Mellitus is a chronic disease that requires sustain support to maintain specific self-care. Support from family becomes the most essential part due to their role as an informal caregiver. This study aimed to determine the effective method of family-based intervention improving glycemic control among DM type II patient. This systematic review based on 4 search engines (Google Scholar, ScienceDirect, Pubmed, and Proquest) included a clinical trial in recent 5 years, published in English, and free full-text access. Keywords used in this study were a family-based intervention in diabetes. Two reviewers independently assessed studies for eligibility and determined study quality by JADAD score. This critical appraisal tool consisted of 3 criterias including randomization, blinding, and withdrawal to describe rigour of the RCT method. Quasi-experiment and single-arm prospective study were excluded. As a result described in a PRISMA flowchart, there were 4 final articles discovered. Model of intervention was more likely similar with variance in follow up time and intensity of education class. This evidence proved significant improvement of glycemic control measured by HbA1C. Diabetes self-management education empowers the family member to provide better assistance in diabetes care.

Keywords: diabetes, family-based intervention, glycemic control

Corresponding author: Gede Budi Widiarta; pandegedebudiwidiarta@gmail.com

Background

Diabetes mellitus (DM) type II is a chronic high volume disease in both developed and developing countries so that it becomes the current global burden issue (Al-Lawati, 2017). The International Diabetes Federation (2017) maps the proportion of the prevalence of type II DM in the world by regional regions in the 2017-2045 range of 35% in North America and the Caribbean; 72% in the Middle East and North Africa; 16% in Europe; 62% in Central and South America; 56% in Africa; 84% in Southeast Asia; and 15% in the Western Pacific region. One significant upward trend is in Southeast Asia. Indonesia as a country in Southeast Asia ranks sixth in the world with the largest incidence of type II DM. This phenomenon makes the World Health Organization (2016) launch DM type II into four priority diseases in global non-communicable diseases (NCDs). In an effort to realize the target of DM type II control, interventions are needed that can increase empowerment and support for patients through Diabetes Self Management Educatuion (DSME) and Diabetes Self Management Support (DSMS) (Duker et al., 2015).

Education and support become decisive in diabetes management as chronic disease. Bruisholz et al (2014) published a restrospective study declared DSME improved quality of care and clinical outcome measeured by diabetes bundle measure. Diabetes budle in this research consisted of pumonary problame, miocard infarction, healt failure, renal disease and Charlson

comorbidity indeks. Program of DSME was implimeted at primary care setting involving diabetes educator (registered nurse or dietitian) following WHO curriculum 10 hours in 12 month. The result show after DSME program patients have improved clinical otcome better than the baseline. Recently, Center for Disease Control and Prevention (2018) discovered the power of DSMES. Program DSMES evolution of education integrated with support implemented by interdiscipline team, provided sharing information and enggagement, inherented personal therapy. In those recommendation, DSMES compared as pill regimen and had a higher psychosocial benefit and no side effect rather than metformin (ADA Standard of Medical Care. Diabetes Care, 2017 in CDC, 2018).

In fact, realization of DSMES and DSMS are challenging. The barrier of this program is the limitation of the health care provider. It is imposible to monitor patient 24 hours patient at home. Patient with diabetes needs longterm care and support to findout personal health care plan that fits to their daily life (Adu et al., 2019). In perspective of developmental stages, range of age patient of diabetes already build of family as basis of society (Miller & DiMatteo, 2013). Family has role in maintain health status and support the other member who suffer in illness (Pamungkas et al., 2017). However, only a view study described the strategy to explore the technical approach of the effective DSMES in diabetes management.

Method

This study was conducted based on 8 steps systematic reviews and metaanalysis(Lindsay S. Uman, 2011). Formulation of the reviews question using Cohrane's PICO acronym stands for population , intervention, comparison, and outcome. Population in this research was determine as adult patient > 18 years diagnosed diabetes mellitus type II. Family based intervention was defined as the involement of family member during the treatment process. The outcome was glycemic controll manifested in HbA1C or other blood glucose laboratorium value and diabetes knowledge related outcome. PICO method later become the approach of keyword formulation "diabetes or T2DM and family

based intervention and blood glucose controll or HbA1C or blood glucose". Inclusion criterias in this study only involed article publish in recent 5 years and clinical studies at least with controll group. Review article, study protocol, and other observational studies were excluded. Searching strategy was using keyword 'diabetes or DM type 2; family support or family intervention, and glycemic control'. PRISMA flowchart of the result decribed at figure 1. Data extraction and data pooling done by at least 2 author. Study appraisal scoring based on clinical study JADAD Score(Berger et al., 2010). Appraisal result and the final dataextraction summarized at table 1 and 2.

Results and Discussion

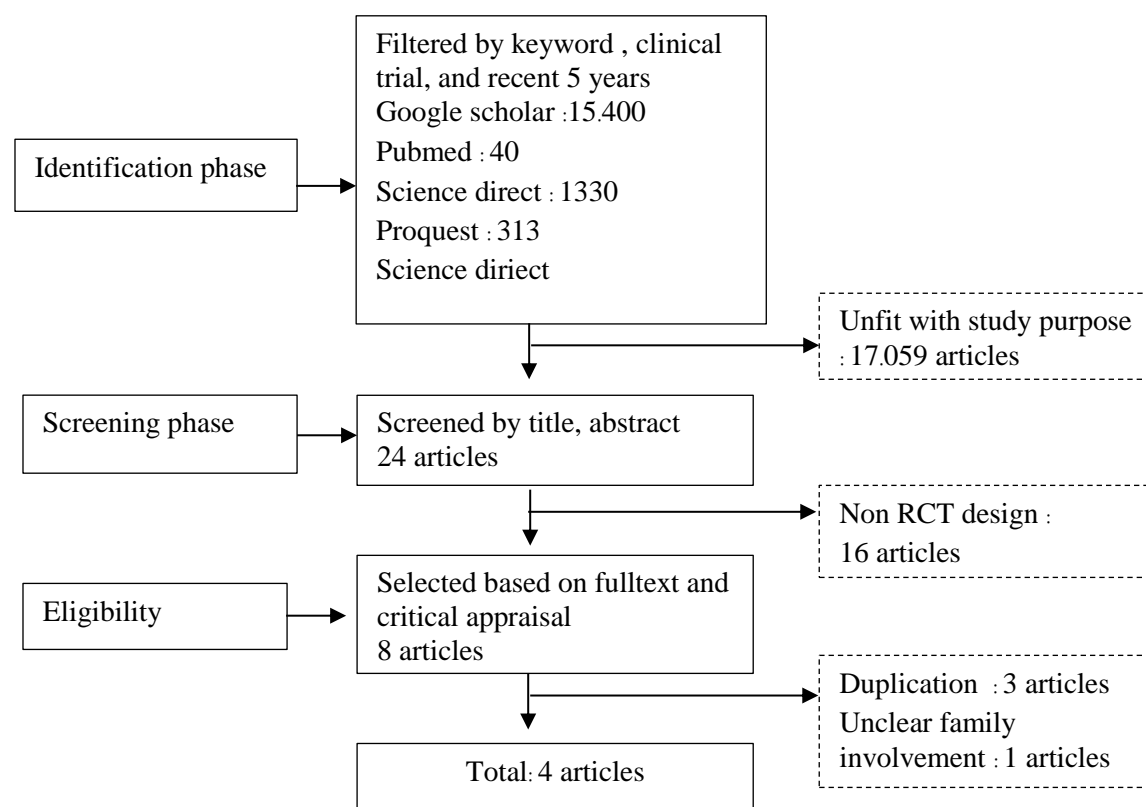


Fig 1 Result of online searching in PRISAMA flowchart

Table 1 Evidence Appraisal Based on JADAD Score

JADAD Score Qualification	Randomization		Blinding		Withdrawal Withdrawal < 20%
	Randomization	Method of Randomization	Blinding	Method of Blinding	
Witchit et al (2017)	+	+	-	-	+
Withidpanyawong et al (2018)	+	-	-	-	-
Gomes et al (2017)	+	+	-	-	-
Maslakpak et al (2017)	+	+	-	-	+

*(+): yes, well described, no, unavailable

Table 2 Summary of final articles

Author/ Research Site	Title	Sample/ participants	Method/ Family involvement	Intervention	Outcome	Result
Witchit et al (2017) Thailand	Randomised Controlled Trial of family oriented self management program to improve self efficacy, glycemic control and quality of life among Thai individuals with Type 2 diabetes	Total participant 140 DM type 2 patients divided into controll and interventional group	RCT This program involved spouse, child, grand child, and sibling of the patients and act as informal care giver, > 18 years old and lived at the same house.	Family-oriented self-management intervention based in self efficacy theory. Its applied on 3 workbook in education class; group discussion involed family and peer; home visit and telephone follow up. Total time of intervention 13 weeks.	-Diabetes Knowledge (DKQ) -Self-management (SDSCA) -Perceived Therapeutic (PTES) -Quality of life (SF-12) -Controll glycemic (HbA1C) -Self-efficacy (DSMES)	Diabetes self-efficacy, self-management, and quality of life improved at intervention group.
Withidpanyawong et al (2019) Thailand	Family based Intervention by Pharmacist for Type 2 Diabetes : A Randomized Controlled Trial	Intervention and controll group contain 98 participant DM type 2 patients at least or oleder than 30 years old.	RCT This program involved adult family member or spouse living together who included in educational package. Family member encougared to do active support.	Family member and patient received 40-50 minutes private class and pharmacist conseling up to 3 month. Phone call follow up also suplemented at 1 and 2 month.	-HbA1C -lipid profile, blood pressure, BMI -diabetes knowledge, family support, therapy adherence, self-management, sel-care.	HbA1C reduced significantly at intervention group. Having family care giver as female spouse was declared as significant helpfull family involment in DSMES.

Table 2 Summary of final articles (cont.)

Author/ Research Site	Title	Sample/ participants	Method/ Family involvement	Intervention	Outcome	Result
Gomes et al (2017) Brazil	Contribution of family social support to the Metabolic control of people with Diabetes Mellitus : A Randomized Controlled Trial	Intervention group consist of 108 participants wether controll group 112 participants	Family involed in group diabetes education and follow up around 12 month	DSMES program in group up to 10 people. The programs were about 4 topics based on social cognitive theory instrument. This intervention goal was to increase interest and education of family member in order to give assitant for the patient. Telephone follow up also inserted.	-HbA1C -Blood pressure -Lipid profile -Ureum -Creatinin	Blood pressure and HbA1C reduced greater at intervention group.
Maslakpak et al (2017) Urmania, Iran	Effects of Face-to-Face and Telephone-Based Family-Oriented Education on Self-Care Behavior and Patient Outcomes in Type 2 Diabetes: A Randomized Controlled Trial	This study compared 3 group intervention consisted of face to face family based intervention, family intervention throug telephone, and usual care. Each group included 30 adult DM type 2 patients.	Family who lived together with patient involen in DSMES through face to face meeting or telephome based education.	Face to face family based intervention twice a week in three months. Telephone based intervention 2 times a weerk in three months.	-self-care (SDSCA) -HbA1C, lipid profile	Face to face family based intervention beficial in improving diabetes selfcare. Telephone based intervention also had potential effect.

On the result of the four articles showed that family based intervention in DSMES is feasible to be applied. All study conducted at least 30 sample of patients and their family who lived together. Model of implementation was rigour, structured by the curriculum, using media and followed with telephone supplementation. Range of

intensity were twice a week in 2-3 months. According the critical appraisal result none of the evidence conducted blinding but more than half studies mentioned explicitly the randomization method. Overall, those articles could give a big picture to conduct family based intervention in DSMES.

Several outcome as Predictor of Glycemic Control

The family based interventions in this study mostly using educational approach to improve glycemic index. HbA1C was measured as the gold standard of glycemic control. The other biomarker related metabolic status also documented such as lipid profile (LDL, HDL, TG, and Total Cholesterol), plasma blood glucose, BMI, ureum, creatinin and blood pressure. The indicator of diabetes knowledge attribute measured in this study were Diabetes knowledge DKQ, Diabetes self-efficacy DMSES and Perceived Therapeutic Efficacy Scale (PTES). Outcome related selfcare adherence measured by SDSCA questioner and Morisky questioner related medication. Psychosocial indicators were assessed family support and quality of life.

According the evidence review, there are several outcomes have been studied. Glycemic index was determined as the main outcome measured by HbA1C. Other objective outcome involved such as lipid profile, blood pressure, body mass index, ureum, and creatinin. Attribute of other outcome to evaluate knowledge based intervention mentioned Diabetes Knowledge (DKQ), Self-management (SDSCA), Perceived Therapeutic (PTES), Quality of life (SF-12), Self-efficacy (DSMES), self adherence, and family support.

Based on the ADA recommendation HbA1C has been declared as strong predictor of diabetes. Cut of point 6.5% of

HbA1C is sensitive for diagnosing diabetes with strong correlation fasting plasma glucose (FPG 7.0 mmol/L) (Sherwani et al., 2016). HbA1C also provides a reliable measurement of chronic hyperglycemia and correlated with long-term diabetes complication. Recently, HbA1C even use as predictor of pre diabetes in children and adult. Clinical study Vijayakumar et al (2017) (2017) involving 2,095 children without diabetes ages 10-19 years monitored through age 39. Using ROC analysis, this study reveal that HbA1C, FPG, and 2hPG are sensitive and specific identify prediabetes in children and adult.

Diabetes knowledge related outcome more likely improve attitude and behaviour in self management. As chronic disease, support and education in diabetes targeted to improve self management and adherence. WHO (2003) in Hsu, Lin, Shu, Yang, & Ko (2013) defined the construct of adherence “...the extent to which a person's behaviour – taking medication, following a diet, and/or executing lifestyle changes, corresponds with agreed recommendations from a health care provider”. Tobert et al (2000) purposed SDSCA as a brief, valid, and specific questionnaire measuring diabetes self management. However in recent study, Schmitt et al (2016) compared DSMQ and SDSCA among 430 diabetes patient. DSMQ statistically has stronger correlation with HbA1C rather than SDSCA.

The Effective DSMES for family

Based on the evidence, there are two theory mentioned that used as the frame of the family based intervention for diabetes management. The self efficacy theory developed by Bandura consist of 4 constructs : physiological information, verbal persuasiob, vicarious experience, and performance accomplishment. This intervention characterized by promotion of the model of succes inspired the others. Self efficacy focused intervention has been studied in 16 articles which is effective improving metabolic control and othe psychosocial predictors of diabetes management. The second one is social cognitive theory also developed by Bandura. This theory emphazied behaviour improvement influenced by social needs and support (emosional, instrumental, and information). Source of the support may comes from peer (friends, collages, and relatives) and family such as spouse, children, grandchildren.

In this study, characteristic of the patient and family member were more likely similar. The patient were adult with range of age minimal 35-40 years old, moderate glycemic control with fasting plasma blood glucose more than 140mg/dL and HbA1C 6-7% without andvace macro or micro vascular complication. Family involement may influenced by marital status while most participant were married. In Asia countries like Thailand culturally family have obligation to take care unhealthy family member by take role as informal care giver. Their role reflacted on provide assitance of

meal preparation and health monitoring status. This study mention that female has higher health awareness as patient or family member. Family member involement more likely related to spouse whether elderly patients were taken care by their daughter or son.

There are variation of implementation family based intervention in this study with overall program was 3-9 months. All evidenced used telephone as the approach of conselling session, follow up, and reminder. The duration of phone call was vary, the range about 15-30 minutes or one study mention the average toke 8 minutes. The conversation was about interview patient and family doubt feeling, motivational enhancement, selfcare adherence checking and problem based solution regarding spesific diabetes management. Most evidence in this study used structured education system as the aproach. One study in Thailand the clinical practice guildeline for diabetes divided into 3 workbook consists of general diabetes knowledge; diabetes diets; physical activity and foot care. Educational program in Brazil used tool called Diabetes Conversation Map consisted of 4 Maps: *How the body and diabetes work; Healthy eating and physical activity; medication treatment and blood glucose monitoring; reaching goals with insulin*. The face to face meeting approach used structure content includeing details information of diabetes diet and physical activity. The other focused on medication using conseling method involving patient and family.

Conclusion

Diabetes as a chronic diseaase needs a sustained and long term treatment. Family support is essensial resourse that can help patient maintain their glycemic controll. Improving knowledge of the family member is challenging regarding role of the family, cultral consideration, and level of education

or health literation. This study recommended telephone call as potential approach of healthcare assitance improving quality of care in chronic illness. Telephone is the most parctical and feasible in Asia or Thailand context due it merits the diabetes population who more likely baby boomer. Baby boomer

prefer use telephone to give feedback and communicate their family uncertain feeling in daily diabetes selfcare routine. It may help better decision making and health outcome.

An innovative strategy of interactive distance learning tools for family assistance is an urgent need to be developed in future research.

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Author Guideline and Instruction

International Journal of Public Health and Health Sciences (IJPHS)

Instruction for Authors & Guidelines (Revised March 18, 2019)

1. About the Journal

1.1. The International Journal of Public Health and Health Sciences (IJPHS) is published by Praboromajchanok Institute for Health Workforce Development (PBRI), a higher educational institute of Ministry of Public Health, Thailand. PBRI is consisting of 39 Sirindhorn Colleges of Public Health, Kanchanabhishek Institute of Medical and Public Health Technology and Abhaibhubejhr College of Thai Traditional Medicine Prachinburi, 30 Boromarajonani College of Nursing and Nursing Colleges under Praboromarajchanok Institute for Health Workforce Development, Ministry of Public Health, Thailand.

1.2 The aim of publishing original articles and contributions is relevant to public health and medical sciences. The scope of the journal is broad, covering health policy and management, health care and services, health promotion/health education/behavioral health, environmental and occupational health, health technology and data management, global health, nursing and nursing sciences, community health, dental public health, community pharmacy, toxicology, and other relevant health issues of health and medical sciences. The IJPHS publishes original papers, systematic review articles, brief reports, case studies, field studies, and letters to the editor.

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2.1. The Editorial Board decides whether a contribution will be sent for peer review, and if so, it will consider the peer reviewers' reports and make the final decision to accept or reject the manuscript for publication. The Editorial Board reserves the final right to decide the section (manuscript type) in which the

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tables and figures. Each of the elements should begin on a separate page.

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Library of Medicine (<http://www.nlm.nih.gov/mesh/MBrowser.html>). Key words will be placed after the abstract for Reviews, Originals, Case Studies and Field Studies.

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Originals

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Thesis/dissertation

Hom, K. E. (2018). *Association of Air Pollution with Longitudinal Changes in Arterial Stiffness and Correlated of*

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