



## Systematic Review on Anti-Aging Health Care

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### Abstract

This systematic review analyzed characteristics of data and knowledge related to anti-aging health care. The samples were 71 studies, classified as 60 English and 11 Thai studies which were published from 2007 to 2016. The research instrument was validated by 3 experts. The results indicated that most of the sampling in the research studies was randomized controlled trial and descriptive research (32.39%), followed by quasi-experimental (21.13%), and systematic literature review research (9.86%), respectively. The methods of anti-aging health care and their outcomes could be categorised into 4 issues: 1) Behavior modification such as calorie restrictions, eating food with sirtuin and having regular exercise 2) selecting aesthetic treatments such as taking vitamins, supplements and hormones, botox injections and dermal fillers 3) using alternative medicine and complementary medicine such as massage, herbal medicine and acupuncture, and 4) stem cell transplants. Nursing roles in anti-aging health care include: 1) health promotion and disease prevention for anti-aging 2) caring for recipients who receive anti-aging medication or synthetic substances. This study suggests that health promotion and disease prevention is one way to provide anti-aging from the inside of the cell to the outside of the person and live a healthy life.

**Keywords:** Anti-Aging, Health Care for Anti-Aging, Systematic Review

### Introduction

Age is an accumulation of the effects of cell deterioration in the body leading to illness and death. Aged cells accumulate a large amount of damaged DNA (Temwiriyankul, 2014). Internal causes are due to cellular changes, while external causes may be due to smoking, alcohol consumption, inappropriate nutrition and contact with sunlight. Furthermore, the factors related to age (Tienboon, 2010; Tamura et al., 2014) are antioxidants, accumulated sugar, chronic inflammations, hormone deficiency and toxin accumulation.

Anti-aging is a science used to delay aging that begins from every cell in the body to extend life with good health (Tengumnuay, 2013) and delay deterioration in healthy and sick people, while maintaining necessary and unnecessary aesthetic beauty. In terms of necessity, maintaining beauty is aimed at preventing diseases and rehabilitating patients (Kathanyutanon, 2008). Unnecessary beauty maintenance is to provide treatment or synthesized substances for the body as external anti-aging treatments. Therefore, anti-aging care is self-care aimed at creating good physical and psychological health, thereby resulting in good health for a lifetime.

The nursing role in health care for anti-aging is aimed at delaying physical deterioration by promoting health and preventing disease in order to give service recipients good quality of life and become senior citizens with good physical, psychological and spiritual health (Miller, 2015). Nurses need to understand the factors influencing anti-aging, anti-aging science and skills and capabilities to provide anti-aging care for service recipients by providing education on health promotion behaviors such as avoiding risk factors that trigger diseases (Hughes et al., 2013), eating healthy foods (Barger et al., 2008), exercising (Berchicci, Lucci & Di Russo, 2013) and providing anti-aging treatments or synthetic substances for the body such as hormone replacement, substance



injections to restore youth to the face (Levy & Lowenthal, 2012), alternative medicine (Bagheri-Nesami et al., 2014) and stem cell transplants (Boonstra et al., 2011). However, according to research reviews and syntheses, there were no clear studies of knowledge on anti-aging healthcare particularly those that are related to anti-aging knowledge and nurses' anti-aging roles in providing healthcare guidelines for the provision of health services to recipients of all ages to promote good health.

**Research Objective:** To study general characteristics and synthesize anti-aging healthcare methods.

**Scope of the Study:** This study is a synthesis of research on anti-aging healthcare conducted domestically and abroad and published from 2007 to 2016 under search keywords determined by the researcher.

#### **Population and Sampling**

The population was composed of anti-aging research and research articles. The subjects were purposively sampled from anti-aging research and research articles published from 2007 to 2016. Inclusion criteria consisted of: 1) Full text research, 2) Domestic and foreign research published in nationally or internationally accepted academic journals in the field of science and technology listed in the TCI database or other databases and 3) Quantitative and qualitative research.

**Ethical Considerations for the Population Studied:** Because this study of secondary data documents did not collect data from individuals, thereby requiring no interactions that would be damaging to researched persons, rights were protected through intra-rater reliability. The first analyst analyzed the collected research, and the second analyst tested the original analysis at least two weeks afterward to compare a current analysis to the previous analysis.

#### **Instrumentation and Instrument Quality Testing**

Research instruments consisted of a data record form composed of three parts: 1) General data characteristics of research; 2) Healthcare methods and outcomes of anti-aging healthcare and 3) Implementation of the findings in nursing. Content validity was tested by three qualified experts consisting of two nursing experts in healthcare and one expert in research reviews. Qualified experts provided recommendations to modify research instruments slightly and the researcher made adjustments according to all recommendations

#### **Data Collection and Analysis**

The researcher searched for related studies and research articles from databases such as Thai traditional medicine journals, alternative medicine journals on skin disease, medical journals on skin and electronic databases such as the Cochrane Library, Journal of Medicine and Medical Sciences. The keywords used in the search were anti-aging medicine, alternative medicine, anti-aging and nursing, massage, aroma, skin care and aging, herbal medicine, chelation, stem cell and dermal fillers. Next, the researcher read studies for the first round in order to check the completeness of the content and sufficiency of the information. During the second round, the researcher read studies and articles on previous research in detail and recorded the information in a synthesis form created by the researcher. The researcher then summarized and presented the results of the analysis by using descriptive statistics, namely, frequency distribution and percentage. Then the researcher analyzed the content by topic, health care practice for anti-aging and the roles of nurses in providing anti-aging healthcare.



### Research Findings

According to the search for data, this study obtained documents meeting inclusion criteria consisting of 60 foreign research articles and 11 research articles in Thailand. When the reliability of the evidence-based practices was divided according to Melnyk & Fineout-Overholt (2005), the findings revealed the following:

**1. General Research Characteristics** – Most of the research articles were randomized controlled trials compared with a control group and descriptive or observational research (32.39%), followed by quasi-experimental research without randomization/analytic case studies (21.13%) and systematic literature reviews/qualitative researches (9.86%) (see Table 1). Anti-aging healthcare methods consisted of the seven characteristics listed in the same table. Most of the research articles emphasized alternative medicine (60.56%), followed by stem cells (12.67%), fillers (8.45%) and exercise (1.41%). The most encountered variables were the efficiency of treatment and the activities that promote the efficiency of treatment (37.5%), followed by numbness in different areas of the body (17.5%), symptoms of side-effects from treatments (7.5%) and factors with relationships or which had an influence on anti-aging treatment, anti-aging care and needs after discharge from a hospital (1.25%).

**Table 1** Number and Percentage of Research Articles Categorized by Research Article Characteristics and Reliability Levels

Research Article Characteristics	Number (Article)	Percent
Level 1: Evidence from systematic reviews, meta-analyses and randomized controlled trials	2	2.82
Level 2: Single research with randomized controlled trials	23	32.39
Level 3: Uncontrolled quasi-experimental research without random group assignments/case study analyses	15	21.13
Level 4: Retrospective or prospective studies	1	1.41
Level 5: Systematic literature reviews of descriptive/qualitative research	7	9.86
Level 6: Descriptive or survey research	23	32.39
Level 7: Evidence obtained from experts	0	0
<b>Total</b>	<b>71</b>	<b>100.00</b>

### 2. Healthcare Methods and Outcome of Anti-Aging Healthcare

**2.1 Behavior modification** was aimed at calorie restriction, consumption of food with sirtuin and exercise with goals to reduce anti-oxidants, accumulated sugar and inflammation processes as follows:

**2.1.1 Calorie restrictions** are aimed at extending life (Barger et al., 2008) because appropriate intake of calories from food will help prevent chronic diseases such as diabetes mellitus, hypertension, obesity, Alzheimer’s Disease, etc. (Blagosklonny, 2010) while also increasing memory in older adults. Calorie restriction is related to metabolism, inflammation processes and cell inflammation (Pallauf et al., 2013; Testa et al., 2014), glucose absorption by muscle cells, tissue sensitivity to insulin to suppress coagulation, reduction of core body temperature and acquiring correct body weight, while also reducing blood cholesterol and blood pressure levels (Pallauf et al., 2013) along with suppressing leptin secretion and increasing adiponectin, which has anti-



inflammatory and anti-coagulant functions. Furthermore, studies have found calorie restriction and exercise has increased SIRT3 levels, which are derivatives of sirtuin (Palacios et al., 2009).

**2.1.2 Eating food with sirtuin** can help to prevent metabolic abnormalities. Sirtuin is a component of cyclic adenosine monophosphate, which transmits signals for cells to adapt, thereby delaying cell deterioration, suppressing LDL oxidation, platelet aggregation, cell inflammation and helping to prevent chronic diseases with anti-aging effects (Wang et al., 2015). This substance is largely found in Mediterranean and Asian food (Pallauf et al., 2013) or Sirtfood as shown in Table 2.

**Table 2** Types of Sirtfood and Component Substances in Sirtuin Stimulation

Food Type	Component Substances in Sirtuin Gene Stimulation
Soybeans, Tofu and Bean Products	Daidzein
Strawberries, Apples, Grapes, Persimmons	Fisetin
Soybeans, Red Onion, Licorice	Isoliquiritigenin
Soybeans	Formononetin
Olive Oil	Hydroxytyrosol
Cabbages and Vegetables from the Kale, Parsley, Bean and June Family	Kaempferol
Red Wine, Grapes and Rhodomyrtustomentosa	Piceatannol Olive Oil
Onions, Apples, White Caper Wine and Rhodomyrtustomentosa	Quercetin
Red Wine, Red Grapes	Resveratrol
Fish Oil	Omega 3, Polyphenol and Glucosinolate
Turmeric	Curmin

**2.1.3 Exercise** helps to reduce fat and adipose tissue in the body, reducing chronic inflammation of muscles and connected tissues (Visioli et al., 2007). In addition, exercise, strengthens the heart and blood vessels. Studies have found exercise at 368 to 1,050 kcal per week, moderate intensity exercise (>4 METS) for at least five hours per week and playing sports 3 times per week for one hour per time helps to stimulate functions of the brain in the prefrontal cortex in older people, which in turn helps to control functions of the limbs and memory (Tulle, 2008; Berchicci et al., 2013).

## 2.2 Treatment or Administering Synthetic Substances into the Body

**2.2.1 Use of medications, vitamins, food supplements and replacement hormones** such as medications to reduce fat and blood pressure in the angiotensin converting enzyme group (ACEI) and the anti-angiotensin receptor group (ARB) help to reduce cell inflammation processes to delay aging. These include the non-steroidal anti-inflammation drugs Metformin, Resveratrol and Rapamycin. This group of drugs suppresses synthesis of TOR proteins (the target for Rapamycin), causing cells to divide to repair damaged parts. Spermidine suppresses nerve deterioration and reduces risks of diseases caused by deterioration such as cancer, dementia, Alzheimer's disease and Parkinson's disease (Bjedov & Partridge, 2011; de Cabo et al., 2014). Use of vitamins such as polyphenol and necessary fatty acids with micronutrient components have been found to reduce cell oxidation and enzymes that respond to stress. Anti-aging hormones are used to replace decreasing hormones due to old age (Arora, 2008; Bartke2008 ;; Tamura et al., 2014; Panjari & Davis, 2010) as shown in Table 3.



**Table 3** Use of Anti-Aging Replacement Hormones and Interactions

Hormones	Interaction
<b>Melatonin</b>	Melatonin is a male hormone secreted from the pineal gland to help control biological rhythms and sleep. Melatonin is an antioxidant. Consumption in males will help increase testosterone levels and erase wrinkles to make the skin soft and clear.
<b>Growth Hormones</b>	Growth hormones help to increase reproductive growth and fertility, reduce fat, increase muscle mass, increase bone density, reduce changes to the brain and blood vessels and increase perception.
<b>Dehydroepiandrosterone (DHEA)</b>	Dehydroepiandrosterone increases the body's ability to use oxygen, increases muscle strength and increase the body's weight in terms of muscle mass especially in body parts without adipose tissue, increases bone density, increases resistance to glucose which helps to reduce blood glucose levels to normal levels, and increases tissue insulin sensitivity.

**2.2.2 Use of synthetic substances for facial rejuvenation** consisted of use of anti-aging substances to reduce wrinkling and damage and to increase skin flexibility. Examples of facial rejuvenation substances and mechanisms acting on the skin (Hughes et al., 2013; Silva et al., 2013; Varvaresou et al., 2011) consisted of Vitamin A, which reduces wrinkles, changes skin cells of the epidermis, increases cohesion of skin layers and substances coating outercells, Vitamin B3 which reduces dark spots and Vitamin E, which is used as an antioxidant to increase moisture, etc.

Furthermore, Botox injections were encountered. Botox is an extract from Botulinum Toxin Type A that has effects of suppressing acetyl choline, a neurotransmitter, to paralyze muscles in the injected area, thereby helping to reduce sagging of facial and neck skin. Furthermore, Botox injections are used to treat some diseases such as abnormalities of the 8<sup>th</sup> pair of nerves, cerebral palsy and migraine headaches (Levy & Lowenthal, 2012; Prager et al., 2012; Kim, 2013; Paoloni, 2013). Dermal fillers were used to increase dermal skin thickness and reduce facial sagging. In addition, Botox and fillers were used in combination. Nevertheless, use of synthetic substances to rejuvenate the face may cause side-effects or complications (Levy & Lowenthal, 2012; Marusza et al, 2012; Funt & Pavicic, 2015) as shown in Table 4.

**Table 4** Complications from Injecting Botox and Fillers into the Body

Type of Synthetic Substance	Complications
<b>Botox</b>	<ol style="list-style-type: none"> <li>1. The skin may have rashes, swelling, hemorrhages and blood clots at the location of injection, causing the substance to spread to nearby tissues over 3 centimeters, resulting in drooping eyebrows and eyelids.</li> <li>2. Dry eyes are a complication from Botox injection at the crow's feet, causing double vision, unclear vision and drooping eyelids.</li> <li>3. Muscle weakness throughout the body causing difficulty chewing and swallowing food, difficulty breathing, muscle atrophy at the temple and urinary incontinence.</li> <li>4. Other patients may salivate or get feelings similar to having a fever with a dry mouth and dizziness.</li> </ol>



Table 4 (Cont.)

Type of Synthetic Substance	Complications
Dermal Fillers	<p><b>Initially (Immediately After Injection to One Week)</b></p> <ol style="list-style-type: none"> <li>1. Physical reactions at the location of injection such as red marks, swelling, pain/pain after pressing, bruises, rashes, prominent tumors/pus.</li> <li>2. Red marks from allergies, swelling, pain/pain after pressing, permanent lumps, asymmetric lumps of the face and palsy.</li> <li>3. Skin pallor or discoloration and ischemia of tissues in the injection area from arterial occlusions.</li> </ol> <p><b>Afterward (More than 1 Week)</b></p> <ol style="list-style-type: none"> <li>1. Local infections, red marks, swelling, pain, pain when pressed, pus lumps and infections in various systems of the body.</li> <li>2. Lumps in the injection location spread to the surrounding skin, creating granuloma and changing skin color.</li> <li>3. Filler movement to nearby tissues can cause swelling under the eyes and permanent prominent scarring.</li> <li>4. Filler injections to blood vessels may cause occlusion such as tissue death in the area supported by that blood vessel.</li> </ol>

### 2.3 Use of Alternative Medicine and Integrated Medicine such as the following:

**2.3.1) Massages** causes physical and psychological effects on service recipients. Studies have found massages to be able to help reduce pain (Sivakorn et al., 2010; Sornpaisarn, Jittakod & Ploysup, 2009; Field et al., 2012; Sritoomma et al., 2014), improve joint movement and organ functions, reduce sympathetic nervous system functions, reduce accumulated sugar levels, reduce cortisol levels, alleviate presenting symptoms of menopause and help to improve sleep. Furthermore, massages had effects to reduce anxiety (Bagheri-Nesami et al., 2014), reduce depression (Field et al., 2012), improve positive attitude to oneself (Finch & Bessonnette, 2014) and improve behaviors in patients with dementia (Guez-Mansilla & Donoso, 2013).

According to 28 research articles, massage methods were found to consist of foot reflexology, acupuncture, light massage, Thai royal massage, Thai private massage, Swedish massage, Japanese massage and touch massage. There were two types of massage therapy consisting of massage integrated with other methods or massage used singly. Massage integrated with other methods was the most frequently encountered therapy such as massage with use of fragrant scents, muscle stretching-tension, herbal compresses and acupuncture. Twenty-two research articles specified a massage time period of 15 – 90 minutes with an average of 32 minutes at a frequency of 1 – 7 times per week or an average of two times per week.

**2.3.2) Use of anti-aging herbal medicine** can be divided into three types consisting of Thai herbs, Chinese herbs and natural foods such as vegetables, fruits and mushrooms, etc., with the objective of reducing pain, assisting with smoking additions and use as food supplements. Natural foods were found to have antioxidants used in skin care with anti-aging properties (Somparn, Naowaboot, Saenthaweesuk & Thaeomor, 2014; Niumsukul et al., 2010; Yu et al., 2013; Parida, Wakame, & Nomura, 2011; Corp & Pendry, 2013; Kim, 2013; Kusumawati & Indrayanto, 2013) as shown in Table 5.



**Table 5** Types of Natural Anti-Aging Foods and Herbs

Properties	Type of Herbs and Food
Delays nervous system deterioration in patients with Alzheimer's Diseases.	Fructuslycii.
Reduces skin sagging and delays aging.	Garlic.
Resists liver cancer spreading.	Turmeric, grapes, beans, berries.
Reduces craving for cigarettes.	Tea, black pepper and St. John Wort.
Resists lipes secretion and reduces cholesterol synthesis	Garcinia cowa leaves and sacred lotus leaves.
Has an effect similar to estrogen to reduce symptoms from menopause.	Soybeans.
Food supplement increasing immunity in patients with loss of appetite.	Products of straw mushrooms.
Driving out uric acid and resisting inflammation.	Celery, Urtica spp, artichokes or Jerusalem artichokes, grapple plants, plants in the Salix spp family, Betula spp, turmeric and lignum vitae.
Increasing Heme oxygenase-1 and helping to create anti-oxidants.	Turmeric, Vietnamese mint.
Having anti-oxidants.	Wheat germ, sunflowers, aloe vera, berries, cranberries, rose hip oil, tomatoes, carrots, sea buckthorns, rosemary, turmeric, green tea, black tea, guava leaves and fruits, grapes and licorice.

**2.3.3) Use of aroma** - Most of the research objectives were to study effects of aroma use on the body (Faturi et al., 2010; Fismer & Pilkington, 2012; Miller et al., 2012; Seong et al., 2013) such as anxiety, insomnia and blood pressure. Aroma is used by inhaling with massage and food. Types of aroma-giving substances studied consisted of limonene extracted from lime, oranges, oil extracted from mint plants, lavender oil and Cananga. Methods for used for administration of herbs were composed of inhalation with massage and consumption.

**2.3.4) Acupuncture** - According to the review of research articles, studies were found to have been conducted on service recipients with numbness at the feet from diabetes (Tanakornnuwat et al., 2012), and problems relating to cerebrovascular disease, where speech was improved (Sun, Xue & Zuo, 2012).

**2.4 Stem cell transplants** research studies were mostly found to have the objective of treating diseases, followed by the anti-aging effects of stem cell transplants, prevention of transplanted stem cells from being infected after transplantation process (Garbin et al., 2011), and improving quality of life and the ability to perform activities after receiving stem cells (Lyons et al., 2011). The most encountered subjects of studies were found to be cancer patients with cancers such as leukemia, lymphoma (Lyons et al., 2011) and other diseases such as tendon diseases (Urdzikova et al., 2013) and cardiac ischemia (Singh et al., 2012). Most anti-aging stem cell transplant research was conducted with experimental animals.

**3. The nursing role in health care for anti-aging**

The nursing role in health care for anti-aging is to promote health and prevent diseases as follows:

**3.1 Anti-Aging Health Promotion Education and Disease Prevention**



3.1.1 Avoid the risk factors that trigger wrinkles and skin changes by not smoking, not consuming alcoholic beverages and avoiding sunlight and stress (Cowdell, 2011; Hughes et al., 2013).

3.1.2 Healthy food consumption through restricting daily calorie intake. According to six research reviews (Barger et al., 2008; Blagosklonny, 2009; Pallauf et al., 2013; Soare et al. 2011; Testa et al., 2014; Witte et al., 2009) restricting daily calorie intake with chronic disease prevention produces effects related to metabolism, inflammation processes and glucose absorption by muscle cells. These aforementioned studies found healthy food consumption reduced fat levels, suppressed blood coagulation and reduced weight. Foods in this group consisted of vegetables and fruits. Patients should be recommended to restrict food intake and to exercise to prevent metabolic abnormalities (Palacios et al., 2009) and eat foods with sirtuin (Wang et al., 2015), which can prevent chronic diseases. Sirtuin can be found in high amounts in Mediterranean and Asian food (Pallauf et al., 2013) in food such as fish oil, red wine, soybeans, tofu, beans, cabbage, red onions, strawberries, apples, grapes and persimmons, etc.

1.3 Three studies found moderate-intensity exercises to help prevent deterioration of organ functions and memory (Berchicci et al., 2013; Tulle, 2008; Visioli & Hagen, 2007) by exercising at moderate intensity for five hours per week or at least three times per week for one hour per time.

## **2. Educate and care for clients who received anti-aging medications or synthetic substances as follows:**

**2.1 In using vitamins, food supplements and hormone replacements,** clients should be aware of types and side-effects of anti-aging medications, vitamins, food supplements and replacement hormones such as medications for reducing fat or blood pressure, non-steroidal anti-inflammation drugs and medications for reducing blood sugar (Blagosklonny, 2009). Two studies (Bjedov & Partridge, 2011; de Cabo et al., 2014) were conducted using rapamycin for anti-aging and were conducted on laboratory animals. The results of the two studies showed that rapamycin has increased the life span of the laboratory animals. Nevertheless, in using anti-aging medications, service recipients must be reminded to be aware that use of anti-aging medications should be under a doctor's recommendation or care because this may cause harmful side-effects.

**2.2 Use of anti-aging alternative medicine** should include explanations of the physical effects of each method on service recipients in terms of pain reduction, improved mobility, lower blood sugar, better sleep and reduced anxiety (Bagheri-Nesami et al., 2013; Field et al., 2011; Tanakornnuwat et al., 2012; Sun, Xue, & Zuo, 2012) and potential complications.

**2.3 In using synthetic substances for facial rejuvenation,** service recipients should receive explanations indicating this is an external anti-aging method or a method to enhance beauty with a greater focus on erasing wrinkles than promoting and preventing diseases. Nurses should educate and provide recommendations on indications, effects and side-effects of skin treatment substances (Hughes et al., 2013; Kusumawati & Indrayanto, 2013; Silva, Celem, Silva, & Costa, 2013; Varvaresou et al., 2011).

Botox and dermal filler injections should be administered under doctors' treatment plans. Nurses may provide recommendations on preparations to receive Botox or dermal filler injections (Bebos, & Lipham, 2010) (Ozgur, Murariu, Parsa, & Parsa, Nanda; 2012 & Bansal, 2013; Weinkle, & Lupo, 2010). Nurses should explain the indicators of treatments for reducing sagging of facial and neck skin, and treatments for symptoms from



diseases such as neurological diseases along with providing recommendations for observing side-effects such as red marks, swelling, pain, bruises, rashes, pus, which may be severe to the point of tissue death from arterial occlusion (Berbos) & (Lipham., 2010; Funt, &Pavicic, 2015; Klein, 2011; Marusza, 2012).

**2.4 In stem cell transplants**, nurses should assess physical and psychological readiness before stem cell transplants (Brown, 2010; Boonstra et al., 2011) along with educating patients on self-care before, during and after stem cell transplants. Patients were usually found to have low white blood cell counts and resistance to newly transplanted cells. In addition, patients received immunosuppressors, which may cause opportunistic infections. Thus, nurses need to separate patients to prevent infections and monitor symptoms and laboratory test results indicating the body's resistance to newly transplanted cells (Saria & Gosselin-Acomb, 2007). Patients should be supported to exercise by contracting muscles or exerting resistance from when they are admitted to hospital until they return home (Hacker et al., 2011). Patients should receive water and food to receive sufficient calories, preferably according to their preferences to help increase food consumption. Nurses should care for patients to ensure that patients receive sufficient sleep (Boonstra et al., 2011). When educating patients, discharge checklists should be used to plan discharge and follow-up visits may be performed using telephones (Cooke et al., 2012; Skaarud et al., 2013)

### **Discussion of the Findings**

Anti-aging science begins from within every cell of the human body and is aimed at prolonging life with good health. Anti-aging methods included health promotion behavior adjustment and disease prevention focused on helping service recipients have good health without causing chronic diseases (Barger et al., 2008; Pallauf et al., 2013; Testa et al., 2014) by having proper food consumption behaviors. The findings were consistent with Pattana Tengumnuay (2013) who mentioned anti-aging by preventing diseases with low-calorie food consumption including Mediterranean foods with anti-oxidants and exercise helps to increase HDL and prevent chronic diseases. Use of medications, vitamins, food supplements and hormone replacements was an effective anti-aging method. In this study, however, this method might have side-effects. Therefore, services should be used under the care of an expert doctor (Weinkle & Lupo, 2010).

Furthermore, the use of synthetic substances such as skin treatment projects, Botox and dermal filler injections are an external anti-aging method. The findings concurred with Datta and colleagues and Gancevicienne and colleagues (Datta, Mitra, Paramesh, & Patwardhan, 2011; Ganceviciene et al., 2012) who found deterioration with age to bring about changes in the skin. Products or injections are used to make cells stop changing in order to reduce wrinkles but may have potential side-effects. Although the aforementioned methods yield quick results, they can also be viewed as an external anti-aging method that does not help service recipients to have good health even though the aforementioned methods are anti-aging methods with fast effects. Without physical health, the aforementioned methods are an unsustainable anti-aging method and, thus, not truly anti-aging. Use of alternative medicine such as massages, herbs and aromas to help in anti-aging science is currently widely accepted. According to reviews of research in this study, research articles on alternative medicine were the most encountered type. This



may be because use of alternative medicine in healthcare helped service recipients to receive holistic care (Ritenbaugh et al., 2011; Shibamoto, Mochizuki & Kusuhara, 2010) to prevent physical, psychological and spiritual deterioration (Miller, 2015).

The nursing role in health care for anti-aging is to promote health and prevent diseases by educating and empowering service recipients to eat healthy food by restricting calorie intake to extend life (Barger et al., 2008). Exercising behaviors helped with anti-aging care (Seals, 2014). Although external anti-aging science is widely used by injecting substances to erase wrinkles with good and fast effects, potential side-effects need to be monitored (Levy & Lowenthal, 2012). Therefore, nurses should educate patients by indicating to service recipients the importance of health promotion and disease prevention for good health in order to achieve more sustainability than anti-aging treatment from outside cells.

According to the findings of this study, anti-aging healthcare methods are composed of good dietary intake, exercise and treatment or providing synthetic substances for the body such as facial rejuvenation substances, Botox injections, dermal fillers, alternative medicine and stem cell transplants. Nurses' anti-aging healthcare roles are to promote health, prevent disease and care for service recipients receiving anti-aging medications or synthetic substances.

**Recommendations** – Health promotion and disease prevention is an anti-aging method from inside cells to outside cells aimed at helping service recipients enjoy good health for a lifetime. The knowledge gained from this study should be developed as anti-aging healthcare practice guidelines. Studies with deeper research methodologies should be conducted such as through the use of meta-analysis.

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