Doctoral Dissertation

Development and Evaluation of a Campus-based Health Promotion Program (CamHPP) for Vietnamese Students in Korea: A Randomized Controlled Trial

Department of Nursing

Graduate School of Keimyung University

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Supervised by Professor Kim Nahyun

February, 2023

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I. Introduction

1. Background

The number of international students in the higher education system in Korea has been increasing recently. According to the Korea Ministry of Education, the number of international students in Korea increased by 66.7% between 2015 and 2021. Chinese students accounted for the highest number, with 44.2 percent (67,348), following close behind Vietnam, with 23.5 percent of the total international students in Korea (Ministry of Education, 2021). Korean educational policies specifically designed to attract international students have increased Vietnamese students in Korean universities.

Vietnamese students moving to a new country face challenges such as cultural, diet, and lifestyle differences, lack of knowledge of the healthcare system, language barriers, and difficulty in socio-cultural adaptation (Huynh, 2020; Khanal & Gaulee, 2019; Kwak, 2022; Lan, 2017; Le, 2011; Nhung, Youngkeun, & Jang, 2021; Thuy, 2017).

Previous research has shown that among international students studying in Korea, Vietnamese students with depression scores were higher than Chinese students and other Asian students (Kwak, 2022). Moreover, the social support level of Vietnamese students was lower than that of Chinese students (Anh, Kang, & Kim, 2021). Compared to Chinese students, Vietnamese students experience more problems such as interpersonal relationships, emotional and language skills, and more difficulties adapting to university life and academic achievements (An & Lee, 2017; Anh et al., 2021; Sun, 2018). Vietnamese students often have limited opportunities to connect with mainstream society and same-ethnic communities in the host country because of barriers such as

financial difficulties, lack of time, and lack of transportation (Anh et al., 2021). Over time, there is an increased risk of isolation; therefore, interventions to enhance social connectedness are necessary. Additionally, as opposed to students in Vietnam, Vietnamese students studying and living in Korea have higher depression and stress (Hoang, 2022; Thuy, 2017; Tran, Soliman, & Chau, 2022; Trang, Trâm, & Cường, 2017). Most Vietnamese students studying in Korea have the burden of finance and tuition fees when living and studying away from home, and many must work to pay their fees. Lack of social support, financial burden, and pressure to attain satisfactory grades result in stress and depression among international students (Lan, 2017; Nhung et al., 2021; Thuy, 2017; Trang, 2016). Moreover, although Korean and Vietnamese cultures show many similarities, the differences in climate, food, and language, this was causing Vietnamese students to experience more stress when living and studying in Korea (Lan, 2017; Thuy, 2017). Compared to students in Vietnam, Vietnamese students studying in Korea who are away from the management and control of their families live more independently in a new environment and take responsibility for their health. However, the students are generally assumed to be in good health during college study and consider their health challenges minor compared with other challenges (Anh et al., 2021; Thuy, 2017).

Vietnamese students are away from home and family in early adulthood and do not have regular health habits. Fixed health habits during this period will affect their future health behavior. Nonetheless, recent research has revealed that while studying abroad period, students are more prone to engage in risky health behaviors that affect well-being, such as physical inactivity, cigarette smoking, drinking, stress, and poor dietary habits (Citak Tunc et al., 2021; Le, 2011; Nguyen, Dale, & Gleason, 1998). Previous studies indicated that the physical activity level of Vietnamese students in Korea was 2.55 out of 5 points, and nutrition behavior scores were the lowest at 2.43 out of 5 points (Anh et al., 2021). Additionally, Kwak (2022) has revealed that among

international students in Korea, Vietnamese students had the lowest health behavior scores (e.g., unhealthy diet, drinking, smoking, sedentary lifestyle, and sleeping habits). Vietnamese students in Korea have barriers to accessing healthcare services. They often do not sufficiently benefit from available healthcare and delay seeking healthcare services when ill. In a study by Kwak (2022) found that students hesitated to access healthcare services because of difficulties in Korean language communication, large cost problems, cultural differences in the medical system, and complicated use procedures. These circumstances may threaten the growing number of Vietnamese students coming to Korea that would resort to unhealthy lifestyles and behavior, which can influence their life course outcomes. Ensuring students' health while studying abroad is critical for preventing health problems later in adulthood.

Given the high rates of stress and face various challenges, much of the prior research only focuses primarily on descriptive experience regarding the acculturative and mental health status of Vietnamese students in Korea (Lan, 2017; Nhung et al., 2021; Thuy, 2017) and description of stress-coping strategies on Vietnamese native and international students (Đặng, 2019; Hoang, 2022; Nguyen & Nguyen, 2020; Pham & Shi, 2020; Tran, Vo, Soliman, Khoury, & Chau, 2022; Shinohara, Kawasaki, Kuwano, & Ohnishi, 2021; Xiong, 2021). Intervention studies among Vietnamese students are lacking. Therefore, it is necessary to identify effective interventions.

Besides, too little attention has been paid to the students studying abroad in health promotion. In previous studies, most health promotion interventions were implemented with native college students, not including international students, who are more likely to be vulnerable to unhealthy risks (Korn et al., 2017; Min & Paek, 2007; Topp, 2014; Tsai et al., 2020; Ulla Díez, Pérez-Fortis, & Franco, 2012). Students studying abroad face cultures, social systems, and regimes different from their home countries (Anh et al., 2021; Kwak, 2022; Sun, 2018), so researchers need a more comprehensive

approach to the aspects of healthcare than individual-level approaches. However, the previous studies have only just proven the health promotion program's effectiveness without comprehensively assessing the problems, barriers, policies, and factors affecting health promotion behavior (Heeren et al., 2017; Joh et al., 2017; Kinney, 2013; Mc Erenoglu, Can, & Sekerci, 2019; Ulla Díez et al., 2012). Therefore, a health promotion program should be developed based on assessing comprehensive is necessary. The PRECEDE-PROCEED model is an appropriate model that provides a comprehensive structure for implementing health behavior promotion projects by planning health promotion programs to promote desirable health behavior (Azar, Solhi, Nejhaddadgar, & Amani, 2017; Kim, Jang, Kim, & Lee, 2022; Porter, 2015). Through the PRECEDE-PROCEED stages, the researcher can assess social support, resource availability, and health program development based on the previous assessment results and application for Vietnamese students to improve health promotion behavior and quality of life. Therefore, we used the PRECEDE-PROCEED model as a framework to design interventions for campus-based health promotion for Vietnamese students in Korea.

2. Purpose of the study

This study aimed to develop and determine the effect of the campus-based health promotion program (CamHPP) targeting Vietnamese students in Korea. The specific aims of the study are the following.

1) To develop a CamHPP for Vietnamese students in Korea
2) To examine the effects of a CamHPP for Vietnamese students in Korea

3. Research hypothesis

In this study, the following hypotheses were established in order to verify the effectiveness of the CamHPP among Vietnamese students in Korea.

Hypothesis 1: The experimental group will show higher level of health perception than the control group.

Hypothesis 2: The experimental group will show higher level of social support than the control group.

Hypothesis 3: The experimental group will show higher level of health care services access than the control group.

Hypothesis 4: The experimental group will show higher level of health promotion behavior than the control group.

Hypothesis 5: The experimental group will show lower level of perceived stress than the control group.

Hypothesis 6: The experimental group will show optimal level of lifestyle-related biochemical indicators than the control group.

Hypothesis 7: The experimental group will show higher level of quality of life than the control group.

4. Definition of the terms

1) Health promotion program

Theoretical definition: Health promotion is defined as the process of enabling people to increase control over, and improve, their health (WHO, 1984). It is an approach to wellness. A health promotion program is defined as a program developed to change health promotion behaviors and improve lifestyles in which behaviors increase the level of well-being and self-actualization of individuals or groups to approach a high level of

health and a positive state of well-being (Pender, 1987).

Operational definition: In this study, a health promotion program is an eight-week program developed for Vietnamese students on campus based on the PRECEDE-PROCEED model. The campus-based health promotion program setting enables the development of more strategic whole-university approaches to promote and empower students and address their needs. It integrates a health education program, a stress management program, and an exercise program by linking with the campus healthcare center, using the available resources and the university to improve access to health care, health perceptions, social support, and health promotion behavior for healthy living.

2) Health perceptions

Theoretical definition: Health perceptions (or perceived health status) are subjective ratings by the affected individual of their health status. Health perception refers to the self-evaluation of an individual's physical and mental well-being (Moore, Newsome, Payne, & Tiansawad, 1993).

Operational definition: In this study, health perception was operationalized to the scores using the Health Perceptions Questionnaire II scale, developed by Ware (1976).

3) Social support

Theoretical definition: Social support is defined as the resources provided by other persons that an individual perceives. It is aid about informational, physical, and mental through interpersonal transactions with family, friends, neighbors, and others (Cohen & Syme, 1985).

Operational definition: In this study, social support was operationalized to the scores using the Interpersonal Support Evaluation List developed by Cohen and Hoberman (1983).

4) Health care services access

Theoretical definition: Health care services access is the timely use of personal health services to achieve the best health outcomes. Access refers to the ability to receive the appropriate care from a proper healthcare provider, at the right time and place, depending on the context (Institute of Medicine, 1993).

Operational definition: In this study, health care services access was operationalized to the scores using the perceived access to health care questionnaire. The questionnaire was revised and supplemented as suggested by Hoseini-Esfidarjani, Negarandeh, Delavar and Janani (2021).

5) Health promotion behavior

Theoretical definition: Health promotion behavior is defined as continuous activities based on the active approach to maintain and promote personal welfare and self-actualization (Pender, 1996).

Operational definition: In this study, the health promotion behavior was operationalized to the scores using the Health Promotion Lifestyle Profile-II questionnaire developed by Walker et al. (2011).

6) Perceived stress

Theoretical definition: Perceived stress is the extent to which persons perceive (appraise) that their demands exceed their ability to cope at a given time or over a given period (Lazarus & Folkman, 1984).

Operational definition: In this study, subjective stress level was measured by the Perceived Stress Scale developed by Cohen, Kamarck, and Mermelstein (1994).

7) Lifestyle-related biochemical indicators

Theoretical definition: Biochemical indicator is a compound typically measured in blood or urine. Lifestyle-related biochemical indicators reflect nutrition intake and lifestyle affecting a person's health (CDC, 2008).

Operational definition: This study used lifestyle-related biochemical indicators as a blood test. It assessed complete blood count (hemoglobin [Hb], hematocrit [Hct], red blood cells [RBC], white blood cells [WBC]), lipid profiles (total cholesterol [TC], triglyceride [TG], high-density lipoprotein cholesterol [HDL-C], low-density lipoprotein cholesterol [LDL-C]), and serum cortisol level.

8) Quality of life:

Theoretical definition: The quality of life is defined as an individual's perception of their position in life and satisfaction of the individual in various domains, including physical, mental, and social well-being in the context of the culture and value systems in which they live (WHO, 1993).

Operational definition: In this study, quality of life was operationalized to the scores using the Vietnamese version of World Health Organization Quality of Life Brief (WHO, 1998).

II. Literature review

1. The status of Vietnamese students in Korea

In recent years, Korea has become one of the most popular destinations for international students studying in Asia. With the influence of the Korean wave, a global phenomenon began in Southeast Asia in the late 1990s with the increasing popularity of K-pop, Korean dramas, and fashion. Apart from the pop culture influence, Korea is the leading force in the digital technology industry, being one of the most innovative countries with a highly internet-connected society (Jang & Paik, 2012). Vietnam's economic growth rate continues to increase, and the economic level of the people increases. Students leave to study abroad in to hope that they will learn in a better environment (Trang, 2016). Moreover, Korean culture and language have grown in popularity in Vietnam through the media and the internet. Additionally, Vietnam and Korea are geographically close. International students have sought higher education in Korea for practicality, and secure country and living costs are cheaper than in many other developed countries (Lee & Bailey, 2020; Nhung et al., 2021). With each passing year, more Vietnamese students are coming to Korea. The number of Vietnamese students studying in Korea soared from 4,451 in 2015 to 35,843 in 2021 (Ministry of Education, 2021).

The inflow of a large number of Vietnamese students produces positive effects in economic aspects as well as in other social aspects. They contribute positively to the development of their host and home countries. However, students living in a new country bring their numerous challenges. Vietnamese students in Korea, like in many other countries, often face hurdles at the expense of their studies and health. They face psychological, health, and

environmental challenges. Starting to live in a new place with no families, students had negative behaviors related to nutrition, stress, and physical activity (Anh et al., 2021).

Students were away from their parents and families and had more freedom to enter a new country. They were more likely to experience lifestyle changes. Therefore, it may be challenging to maintain health promotion behaviors, such as exercising or refraining from harmful health behaviors. Additionally, Vietnamese students may try health risk behaviors to control stress and anxiety without recognizing the importance of health and due to a lack of management from their parents. Previous studies showed that the physical activity level of Vietnamese students in Korea was 2.55 out of 5 points, and nutrition behaviors scores were the lowest (Anh et al., 2021). Among international students in Korea, Vietnamese international students had the lowest health behavior scores (Kwak, 2022). When international students move to a new socio-cultural environment, they may be unfamiliar with the host culture. Korean and Vietnamese cultures show many similarities, such as sharing a historical and cultural background in sino-centric confucianism. However, there are also differences (e.g., climate, food, language, and culture). Vietnamese students experience more acculturative stress than Chinese students (Anh et al., 2021; Sun, 2018). Most Vietnamese students in Korea have the burden of finance and tuition fees when living and studying away from home, and many have to work to pay their fees (Anh et al., 2021; Thuy, 2017). Moreover, the mean social support score among Vietnamese students (2.53 out of 4 points) was lower than that of Chinese students (3.08). Lack of social community, the burden of finance, different food cultures, unfamiliar living circumstances, studying schedules, or difficulties related to language and culture, Vietnamese students experience accumulated pressure to adjust to the new environment, and thus their stress levels and depression increase. A previous study has shown that Vietnamese students' depression scores the higher than

Chinese students and other Asian students (Kwak, 2022). Vietnamese students studying and living in Korea with a rate of depression (43.1%) higher than students in Vietnam (33%; Thuy, 2017; Trang et al., 2017). Vietnamese students face multiple challenges due to cross-cultural transition. Lack of physical activity, health promotion behavior, stress, and depression can affect the student's health and quality of life.

2. Health promotion behavior of college students

The period of college study represents many new challenges for emerging adults, including organization of everyday life, studies, and the social environment, as well as taking responsibility for one's health during a period where one is generally assumed to be in good to excellent health (El Ansari, Suominen, & Berg-Beckhoff, 2015). This period is one in which students are vulnerable to health-related problems because activities promoting health are not readily available, and there is a lack of concern for health management and ignoring the importance of health (Park et al., 2002). It is essential to establish a health promotion among college-age students because they are relatively easier to change behavioral patterns during early adulthood. Promoting healthy behavior during this period increases their chance of being healthy adults in the future (Altun, 2008; Tsai et al., 2020).

Life at the university is a transitional stage when students leave home and become independent. College students exhibit low levels of physical activity, high levels of sedentary behavior, poor dietary behavior, sleep problems, high stress, and increased substance use (Dinger et al., 2018; Min & Paek, 2007; Peterson et al., 2018; Rezaei Adaryani & Rezaei Adaryani, 2012; Samuolis et al., 2015). A recent report from Finland found a high prevalence of smoking, alcohol consumption, and other substance use among university

students. Researchers have reported that approximately 63% of university students categorized themselves as occasional and regular drinkers (Steptoe & Wardle, 2001). Students are also given more freedom upon entering college, and their diet and sleep patterns become irregular (Lee, Ham, Kim, & Joe, 2006). Moreover, college students experience a lack of sleep and psychological stress due to an irregular lifestyle filled with various scholastic events and gatherings. Such an environment harms their physical and mental health. Furthermore, according to previous research, although most universities provide a physical environment that encourages physical activity, more than 54.8% of university students do not participate in physical activities (Lee et al., 2017; Puello, Beltrán, & Molina, 2015; Teleman, Waure, Soffiani, Poscia, & Pietro, 2015). Just like other students, Vietnamese students have different problems with health promotion behavior among college-age. During college, these students in early adulthood do not have regular health habits. They are more prone to engage in risky health behavior that negatively affects well-being, such as physical inactivity, cigarette smoking, and drinking (Nguyen et al., 2008; Tien Nam et al., 2020; Trang et al., 2017). These unhealthy behavior are risk factors for multiple lifestyle diseases in student routines that could impact students' health and lifestyles into adulthood. Therefore, it is essential to establish health promotion among college-age students.

For successful health promotion, it is essential to help students recognize the importance of a healthy lifestyle. From the lifestyle perspective, healthy behaviors should be continuous rather than temporary, and positive lifestyle changes require an individual, group, and social changes. These changes are possible through health promotion interventions (Glanz et al., 2008; Madani, Alizade, Ghanbarnejad, & Aghamolaei, 2015; Min & Paek, 2007; Park & Eom, 2010). Health promotion interventions in college are an ideal and cost-effective means of developing a healthy lifestyle because these individuals are in a unique stage of knowledge absorption and personality shaping.

3. Health promotion programs for college students

Students' health can be promoted by changing their health behaviors and helping them recognize the importance of a healthy lifestyle. From the lifestyle perspective, healthy behaviors should be continuous rather than temporary, and positive lifestyle changes require an individual, group, and social changes. These changes are possible through education and health interventions. The educational intervention effectively improves students' knowledge, attitudes, and behaviors related to health promotion lifestyles and their dimensions. Health promotion interventions enable people to increase control over their health and environments by providing health information and education and enhancing life skills (Kumar & Preetha, 2012; Rozmus et al., 2005). Besides, when appropriate, it empowers people to manage contributing factors to their health and change their lifestyle to improve or maintain their health (Fashafsheh et al., 2021). Health promotion interventions in college are an ideal and cost-effective means of developing a healthy lifestyle because these individuals are in a unique stage of knowledge absorption and personality shaping (Glanz et al., 2008; Madani, Alizade, Ghanbarnejad, & Aghamolaei, 2015; Min & Paek, 2007; Park & Eom, 2010).

To date, most of the interventions targeting college students were health promotion education and exercise programs considered (Heeren et al., 2018; Korn et al., 2017; Min & Paek, 2007; Topp, 2014; Tsai et al., 2020; Ulla Díez et al., 2012) (Table 1). Health promotion intervention among students by conducting the program with lectures addressing health promotion behavior, physical, psychological and spiritual, lifestyle modification, and positive dietary changes (Min & Paek, 2007; Ulla Díez et al., 2012). Results showed that healthy habits and health could be maintained and promoted by changing attitudes and perceptions toward health (McKinney, 2013). Health promotion

programs effectively provide opportunities for students to access health information, knowledge, skills, self-confidence, and available health services and resources. Besides, the results demonstrated that the health promotion program positively affected the students' health responsibility, health perception, and self-efficacy levels (Erenoglu et al., 2019; Joh et al., 2017; Tsai et al., 2020). However, participants are first-year or only undergraduate students; therefore, the results may not be generalizable to others (Erenoglu et al., 2019; Tsai et al., 2020). Today, with the increased use of electronic media for communication and information by students, web and software-based health promotion projects appear effective. According to McKinney (2013), an online health promotion program was conducted to promote self-efficacy to incorporate positive dietary changes among college students. Results of the research showed that the health promotion program is effective in lifestyle modification and improving self-efficacy. Previous college students' physical exercise programs have demonstrated that students could increase their level of physical exercise, positively impact physical function, and improve health promotion behavior (Heeren et al., 2017; Park, 2011). Despite the significant effects, it was unclear whether they would last long enough to result in actual behavior. Longitudinal research suggests testing the long-term effects of the intervention by measuring the actual physical activity rather than behavioral intention.

Based on the results of the previous studies, interventions effectively improved students' health promotion behavior, such as physical activity, health-promoting lifestyle, health perceptions, and stress management. However, all studies on intervention health promotion behavior for students did not evaluate the effect of the health promotion program on students' quality of life. In addition, most previous interventions were implemented with native college students, not including international students, who are more likely to be vulnerable to unhealthy risks. Especially with the number of Vietnamese students studying abroad increasing in recent years, intervention in health

promotion behavior for these students is essential.

Besides, previous studies have applied health behavior theories in health promotion programs on college students, such as social cognitive theory, the health belief model, and the theory of planned behavior (Heeren et al., 2018; Min & Paek, 2007; Ulla Díez et al., 2012). However, most studies conducted various intervention programs without comprehensively assessing the problems, barriers, and factors affecting health promotion behaviors and identifying students' health education needs. Therefore, a health promotion program should be developed based on assessing risk factors and considering the special characteristics and needs of students are necessary. The PRECEDE-PROCEED model is a comprehensive structure that should be applied to assess health needs, health problems, and factors affecting students' health promotion behaviors and quality of life.

Moreover, most of the previous studies on intervention health promotion among college students have results only based on student self-report measures to evaluate the effectiveness of intervention health promotion. Before and after an intervention, no studies objectively evaluated students' health conditions, such as stress level, the impact of dietary changes, or physical activity level. Therefore, objective measures in health promotion intervention are necessary to judge the effectiveness of intervention programs among college students accurately.

Table 1. A literature review on health promotion programs for college students

Author (year, country)	Design	Participants	Sample size	Intervention	Results
1. Sabooteh et al. (2021, Iran)	Experimental study (pre-test, post-test and follow-up)	University students	225 software 69; web 66 control group:71	E-health educational: web and software	The level of physical activity was increased
2. Solhi et al. (2021, Iran)	Quasi-experimental with pretest-posttest design	University students	Intervention: 65 Control: 65	Educational intervention: five training sessions. Posttest: 1 month and 3 months later	Perceived self-efficacy and mean scores of health-promoting lifestyle were increased
3. Tsai et al. (2020, Taiwan)	Pretest and post posttest design	Undergraduate nursing students	112	Health promotion education three weeks: physical, psychological, spiritual, and social health promotion.	Improvements in the meaning of life, positive beliefs, and well-being immediately after the intervention

(Table continued)

Table 1. (Continued)

Author (year, country)	Design	Participants	Sample size	Intervention	Results
4. Brett (2020, US)	Quasi-experimental longitudinal	Graduate Students	Intervention: 59 Control: 33	Seminar course: nutrition, physical activity, mental health, and social support Follow-up: approximately 10-12 weeks after completion of the course	Mental health, physical activity, and nutrition, life satisfaction, social support were increased
5. Heeren et al. (2017, Africa)	A randomized controlled pilot study	Second-year students	176 Intervention: 85 Control: 91	The intervention consisted of 8 modules (education, exercising on campus)	Increases in self-reported physical activity
6. Korn et al. (2017, Israel)	Pre-test and post-test control groups.	Undergraduate students	124	Health promotion and physical activity education	Positive changes in students' lifestyle, health perceptions, and well-being

(Table continued)

Table 1. (Continued)

Author (year, country)	Design	Participants	Sample size	Intervention	Results
7. Ulla Díez et al. (2012, Mexico)	Randomized controlled trial	First-year students	73 Intervention: 31 Control: 42	Health-promoting education program (7 sessions), with a 3-month follow-up	After the intervention, students had a healthier lifestyle (health profile score, PA, nutrition, health responsibility, and stress management were increased)
8. Topp et al. (2011, US)	Pre-test and post-test	College students	-Intervention: Group 1: 29; Group 2: 20 -Control: 24	Intervention: 10-week program (knowledge, attitudes, perceptions, and beliefs), nutrition	Improvements in physical activity and attitudes toward a healthy dietary intake
9. Park (2011, Korea)	randomized controlled experimental	College Student	Intervention: 28 Control: 25	Exercise program 10 weeks	Effective in promoting health-promoting behavior

(Table continued)

Table 1. (Continued)

Author (year, country)	Design	Participants	Sample size	Intervention	Results
10. Min (2007, Korea)	Pre-test and post-test control groups	University students	148 Intervention: 80 Control: 68	Health education program (15 weeks) on health-promoting behavior and self-efficacy	Increase in health-promoting behavior and self-efficacy.
11. McKinney (2003, US)	2-group randomized controlled	College students	Intervention: 19 Control: 18	Online health and wellness promotion programs for college students (12 weeks)	Positive dietary changes and improving self-efficacy

4. Theoretical framework of research

The theoretical framework of this study was constructed based on the PRECEDE PROCEED model developed by Green and Kreuter (Green & Kreuter, 1991). This model is used to identify health education needs and analyze health problems and factors affecting people's health status. The PRECEDE-PROCEED model is a comprehensive structure for assessing health needs, health problems, and factors affecting health-promoting behaviors and quality of life (Azar et al., 2017; Kim et al., 2022; Porter, 2015).

PRECEDE is an acronym that describes the planning and developmental stages of the model: predisposing, reinforcing, and enabling constructs in educational/environmental diagnosis and evaluation. PRECEDE consists of five phases (Figure 1). Phase one involves determining the quality of life or social problems and needs of a given population. Phase two identifies the health problems and analyzes the behavioral and environmental determinants of the health problems. In phase three, identify the factors predisposing to, reinforcing, and enabling the behaviors and lifestyles. The fourth stage is delineating the intervention strategies and final planning for their implementation. Its purpose is to identify policies, resources, and circumstances prevailing in the strategy's organizational/community context that could facilitate or hinder strategy implementation.

PROCEED is an acronym for implementing strategies and evaluation stages: policy, regulatory and organizational constructs in educational and environmental development. PROCEED is composed of four additional phases. In phase five, intervention strategies are selected based on previous steps, and planners must assess the availability of necessary resources such as time, people, and funding. In addition, any organizational policies and regulations that could affect program implementation should be considered and planned

accordingly. At this point, the population health strategy is ready for performance. Phase six process evaluation determines the extent to which the program was implemented according to protocol. Phase seven involves impact evaluation and assesses change in predisposing, reinforcing, enabling, and behavioral and environmental factors. Finally, outcome evaluation determines the program's effect on the population's health and quality (Glanz, Rimer, & Lewis, 2002; GreenLW, 2004) in figure 1.

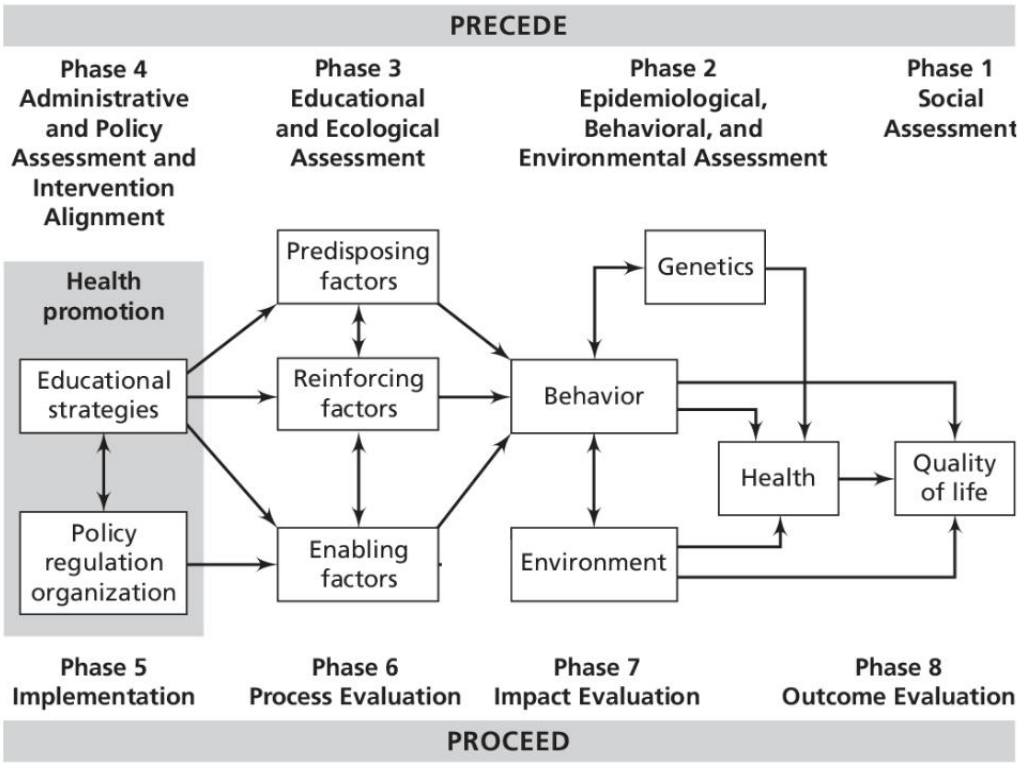

Figure 1. PRECEDE-PROCEED planning model

Note: This model was produced by Green and Kreuter in 2005, summarizing health program planning with an educational and ecological approach. From Health Program Planning. An Educational and Ecological Approach (4th ed. pp 255-316), by Green & Kreuter, 2005, New York: McGraw-Hill.

Based on the PRECEDE–PROCEED model, this study derived a conceptual framework into the evaluation stage (stages 1-4), the program implementation stage (stage 5), and the evaluation stage (stages 6-8) as follows. In the first stage, social assessment, the researcher determine the quality of life and barriers to quality of life. In the second stage, health in epidemiologic, behavioral, and environmental assessments was assessed by healthy lifestyle habits and stress levels. In addition, the researcher identified health promotion behavior factors among Vietnamese students for this phase. Vietnamese students must have normal health through health examination before studying abroad; therefore, the assessment of genetic factors was excluded. In the third stage of education and ecological assessment, the predisposing factors consisted of health perceptions, responsibility, health knowledge, self-esteem, and self-efficacy (Ahn, Park, & Ra, 2014; Anh et al., 2021; Hwang & Oh, 2020; Kim et al., 2015; Kim & Kim, 2018; Sun, 2018). According to previous studies, among these factors, health perception was the most influential, significantly correlated, and a significant factor in helping improve physical activity levels and students' health promotion behavior (Kim et al., 2015; Kim & Kim, 2018). The reinforcing factors consisted of advice and feedback from health care providers, social support, and peer influence (Anh et al., 2021; Hwang & Oh, 2020; Jeong & Song, 2018; Sun, 2018). Besides that, the enabling factors consisted of resource availability and accessibility of sources such as health care services accessible on the campus and healthcare system (Kwak, 2022; Masai, Güçiz-Doğan, Ouma, Nyadera, & Ruto, 2021). The fourth stage, administrative and policy diagnosis, and intervention alignment were determined through an encounter with health care center staff and field surveys at the health care center in the university. The budget, human resources, facilities, and policies supporting the health promotion program were assessed. Besides, student focus groups and interviews were conducted, and the environment and timetable of the Vietnamese students were considered.

According to the PROCEED phase, in the fifth stage, a health promotion program was developed based on the review of previous studies and the results of the PRECEDE phase. After an expert group assessed validity, the program was corrected and supplemented. A final program, including a health education program, stress management program, and exercise program, was conducted for the experimental group. The researcher considered the university policies, utilized the available resources in the university, and linked with the campus healthcare center to implement the program. As a result of applying the program base on the PRECEFDE-PROCEED model to Vietnamese students, health perception, social support, and resource availability were evaluated in the process evaluation stage. In addition, health promotion behavior was assessed in the impact evaluation stage. Finally, the outcome evaluation stage consists of perceived stress, biochemical indicators, and quality of life was evaluated.

The subjects of this study are a community group who live and study in a new country. Their health problems are not acute but chronic issues caused by environmental factors and lifestyles. It is very complex, and various factors are involved because it is necessary to practice health by inducing behavior change. Given the proven effectiveness and flexibility of the PRECEDE-PROCEED model, to develop a health promotion program for Vietnamese students in Korea and evaluate the program's effectiveness, it is reasonable to use the PRECEDE-PROCEED model. The conceptual framework of this study and the relationship between the research concepts are schematic as follows (Figure 2).

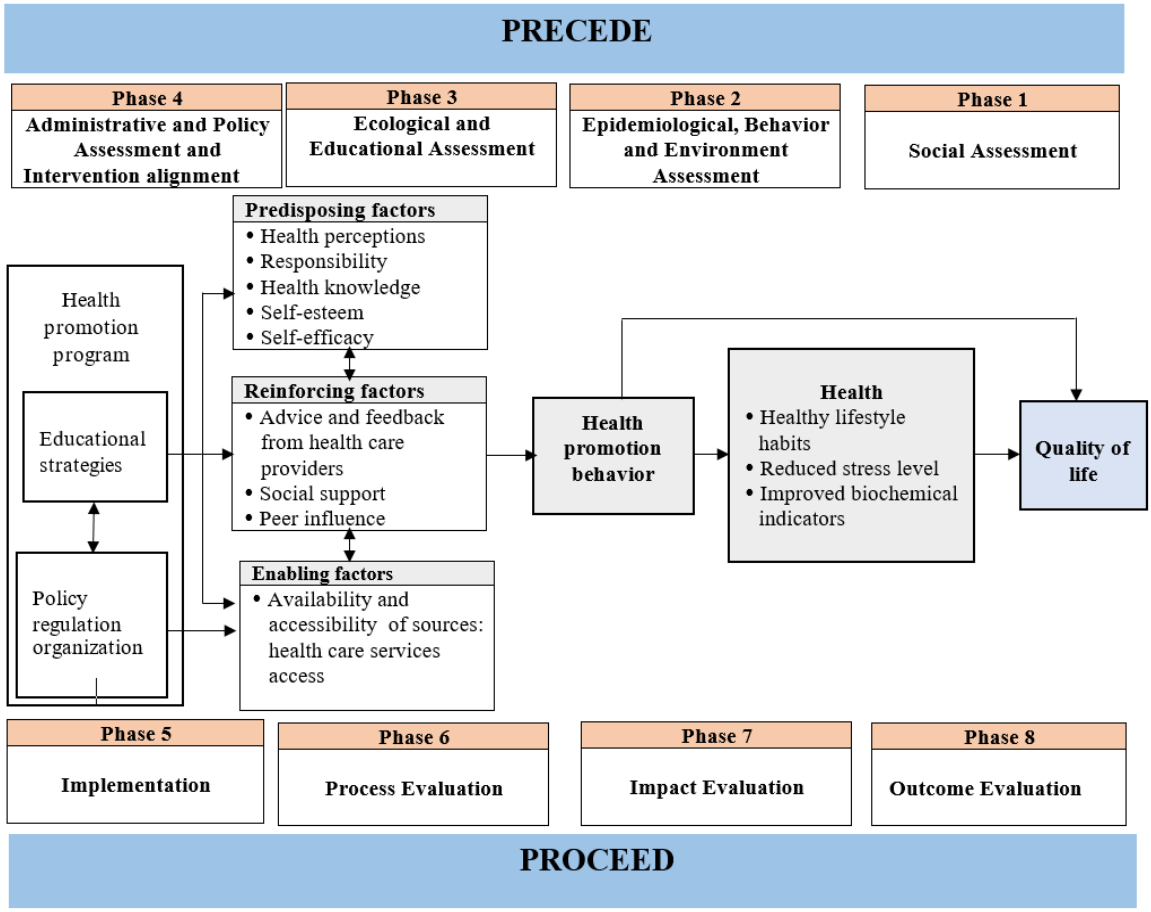

Figure 2. The theoretical framework of the study

III. Methods

1. Research design

This study adopted a randomized controlled trial with the pretest-posttest control group design. Students are randomly assigned to receive an experimental or control group using an automated computer-based random integer generator. This method allows the researcher to generate random integers using true randomness, and the numbers generated will be picked independently.

After the student meets the criteria and signs the consent form, the researcher assigns the subjects to the experimental or control group. Participants were given information on which group they were allocated. The experimental group participated in the health promotion program once a week for eight weeks. The control group was provided with education on general information for health maintenance; however, they could voluntarily participate in the CamHPP after the posttest.

Group	Pretest	Intervention	Posttest
Experimental group	E1	Xe	E2
Control group	C1	Xc	C2

E: Experimental group

C: Control group

Xe: CamHPP (8 weeks)

Xc: Education of general information for health maintenance (60 minutes)

E1, C1: Pretest

E2, C2: Postest

Figure 3. Study design

2. Participants and recruitment

The participants of the study were Vietnamese students studying at K University. The international student offices and the Vietnamese international students' association at K University were referral sources. The selection criteria were (1) Vietnamese students studying at K University, (2) students who have lived in Korea for longer than six months, (3) able to read and understand Vietnamese, (4) they owned a smartphone (iPhone or android) and (5) no history of participation in any health promotion programs, whereas the exclusion criteria were the exchange student.

The sample size was calculated by G* Power 3.1 software. The effect size for calculating the sample size was measured based on the results of the previous paper in the meta-analysis of health promotion interventions with a significance level of .05 power of .95, and the effect size of .49 was calculated as a result of the minimum sample was 50 (Kok, Borne & Mullen, 1997), 28 students per group were considered with a dropout probability of 10%.

Recruitment was achieved through email and the Vietnamese international students' association fan page. The advertisement included aims, confidentiality, and design. Students indicated participating in the study by texting the telephone number in the advertisement. The students then received a text message with a link to agree to participate and complete an online baseline questionnaire. Eligibility will determine from responses to the baseline questionnaire (studying at K University, students who have lived in Korea for longer than six months, no history of participation in any health promotion programs, not an exchange student). A total of 55 students completed the study, 27 in the experimental group and 28 in the control group; one student dropped out of the experimental group for pregnancy reasons (Figure 4).

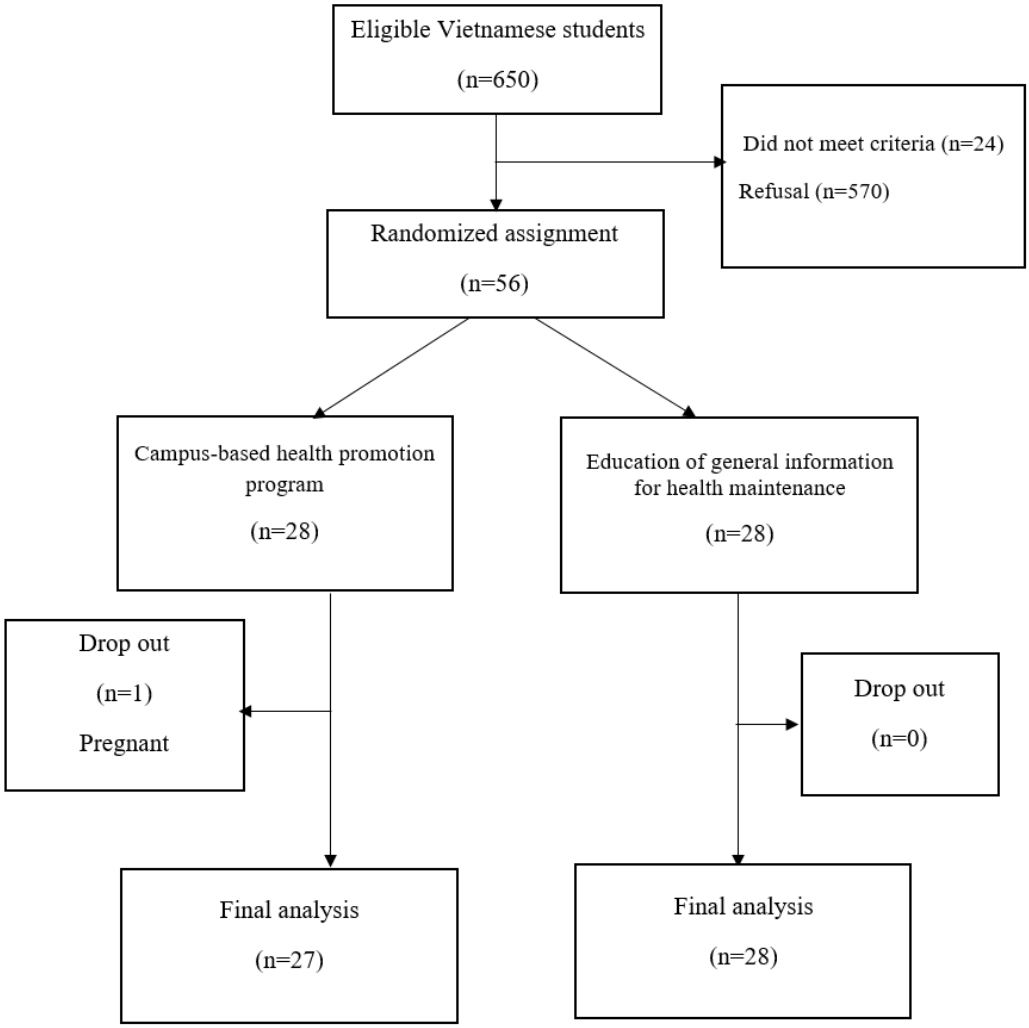

Figure 4. Flowchart of the selection process for the target group

3. Measurements

The research instrument is the Vietnamese version of a self-report questionnaire, including demographic characteristics, health perceptions, social support, health promotion behavior, perceived stress scale, and quality of life. It was translated from previous instruments using the back translation technique

conducted by two bilingual translators. The content equivalence of the items was also checked by means of reconciling and evaluations performed by the translation team and health professionals. Reconciled versions were pilot tested with a small group of students (n=10). Validity and reliability of the questionnaires were performed. Furthermore, the app pedometer-Cashwalk was used to measure objectively physical activity, and laboratory monitoring was also conducted. Dependent variables and measurement tools based on the theoretical framework of this study are as follows.

1) Vietnamese students' demographic characteristics

Vietnamese students' demographic characteristics included gender, age, marital status, education, Korean proficiency, length of stay in Korea, residence type, and source of living expenses.

2) Health perceptions

The Health Perceptions Questionnaire (HPQ) Form II was developed by Ware (1976). The questionnaire includes both physical and mental health. It was used to assess subjective health. It consists of 32 items, of which measure perceptions of prior health, current and health outlook, resistance/susceptibility to illness, health concerns, sickness orientation, and the remaining six items evaluate rejection of sick role and attitude toward going to the doctor. This tool was measured on a 5-point Likert scale. Negative questions were inversely scored, such that higher scores on this scale indicated a higher degree of health perception. Cronbach's alpha for the original instrument was .90 (Ware, 1976). And in this study, HPQ total of 37 items was translated from English to Vietnamese to measure the health perceptions of the Vietnamese student in Korea, with Cronbach's alpha was .89.

3) Social support

The Interpersonal Support Evaluation List (ISEL) developed by Cohen was used to measure social support received by Vietnamese students (Cohen & Hoberman, 1983). ISEL evaluates how others affect a person's responses to stressful events. Questionnaire items were revised and supplemented as suggested by Park et al. (2008) and Sun (2018). The scale was translated into Vietnamese and used to measure the social support obtained by Vietnamese students in this study. The 16-item tool measures self-reported social support rated on a 4-point Likert scale, ranging from 1 (definitely false) to 4 (definitely true). A higher score indicates higher perceived social support. Cronbach's alpha for the original instrument was .90 and .84 (Sun, 2018). The internal consistency for the scale in the present study was .82.

4) Health care services access

The perceived access to health care questionnaire was used to assess the accessibility of healthcare services. The initial questionnaire was developed according to Penchansky and Thomas' model of access (Saurman, 2016). The questionnaire was revised and supplemented as suggested by Hoseini-Esfidarjani, Negarandeh, Delavar, & Janani (2021). This study translated this scale into Vietnamese and adapted questions to measure the accessibility of healthcare services for Vietnamese students. The adapted questionnaire consisted of 2 items (accessing health center at university and understanding health services and health care system when living in Korea). The 22-item tool measures perceived access to health care rated on a 5-point Likert scale (strongly agree to strongly disagree). A higher score indicates higher perceived access to health care. Cronbach's alpha for the instrument was .86 (Hoseini et al., 2021). For the present study, Cronbach's alpha was .84.

5) Health promotion behavior

Health promotion behavior was measured using the Health Promotion Lifestyle Profile-II (HPLP-II). HPLP-II is a revision of the HPLP developed by Walker (2011). It measures health-promoting lifestyles as HPB by focusing on self-initiated actions and perceptions that maintain or enhance the individual's level of wellness, self-actualization, and fulfillment. It is a 52-item questionnaire composed of six subscales, including health responsibility, nutrition, physical activity, stress management, interpersonal relations, and spiritual growth. The responses have been evaluated on a four-point Likert scale ranging from 1 (never), 2 (sometimes), 3 (often) to 4 (routinely). Cronbach's alpha for the HPLP total scale was .92, and that of the subcategories ranged from .79 to .87. In the present study. This scale was translated into Vietnamese and used to measure the HPB of the Vietnamese students in this study, with Cronbach's alpha was .85, and for the subscales, it varied between .74 and .89.

Additionally, we measured objective physical activity levels among health promotion activities using an app. The Cashwalk pedometer app was selected to measure the objective physical activities of Vietnamese students in the current study (Figure 5). This app with monetary rewards allows the participant to earn money just for walking or running. Earn coins and exchange them for gift cards from famous brands and products, and the enjoyment of using fitness apps contributes to having a more significant impact on exercise and directly affect the amount of activity (Kim, Shon, & Kim, 2020; Kim& Chung, 2020). In this study, the app records students' daily steps.

Figure 5. The Cashwalk pedometer app (CashWalk, Inc.)

6) Perceived stress scale

The Cohen's Perceived Stress Scale (PSS) was used to assess the stress as perceived by the students (Cohen, Kamarck, & Mermelstein, 1994). It is a self-reported questionnaire that measures the degree to which an individual appraises a situation in their life as stressful. The scale consists of 10 items, including six positively and four negatively phrased items. Respondents rate each item on a 5-point scale ranging from 'never (0)' to 'very often (4)'. The scores for negatively phrased items are reversed, and then the scores for all ten items are added for each individual. The individual scores on PSS can range from 0 to 40, with higher scores indicating higher perceived stress ('low stress = 0~13', 'moderate stress = 14~26', and 'high stress = 27~40'). Cronbach's alpha was .78. For the present study, this scale was translated into Vietnamese to measure the perceived stress of Vietnamese students, with Cronbach's alpha for the PSS-10 scale was .77.

7) Biochemical blood indicators

This study used biochemical indicators to evaluate Vietnamese students' general health status, dietary habits, and stress levels. Fasting blood samples were obtained from the antecubital vein following a 10-hour overnight fast. Blood samples were analyzed for complete blood count (hemoglobin [Hb], hematocrit [Hct], red blood cells [RBC], white blood cells [WBC]), lipid profiles (total cholesterol, triglycerides, HDL-C, and LDL-C), and serum cortisol level. Blood indicators for evaluating stress level, health status, and dietary habits among Vietnamese students. Based on the blood test results, hemoglobin (normal value: male 13~17 g/dL; female: 12~16 g/dL); lipid profiles (cholesterol <200 mg/dL, HDL: male 35~55 mg/dL; female: 45~65 mg/dL > 40 mg/dL, LDL <100mg/dL, triglyceride <150 mg/dL); and serum cortisol (3.7~19.4 μg/dL, between 6-10 am). If the result is way outside the normal range, it means abnormal.

8) Quality of life

The Vietnamese version of the World Health Organization Quality of Life Brief Version (WHOQOL-BREF) measured quality of life. It consists of 26 items to assess the perception of quality of life in four domains, including physical health, psychological, social relationships, and environment, and two items on the overall quality of life and general health. A higher score indicated a better Quality of Life. Cronbach's alpha for the instrument was .89 (Ilić et al., 2019), and in this study, Cronbach's alpha was .82.

4. Research process

The study was conducted in the order of development of the CamHPP (PRECEDE phase), training of a research assistant, pretest, implementation of

CamHPP, and posttest. The detailed procedures of each step are as follows.

1) Development of the health promotion program (PRECEDE phase)

The health promotion program development process for Vietnamese students included preliminary assessment, review of previous studies, intervention program planning and pilot study, evaluation of the validity, and final health promotion program (Figure 6).

(1) Preliminary assessment

In this study, the health promotion program development was based on pre-diagnosis in the PRECEDE phase of the PRECEDE-PROCEED model. The PRECEDE phase was made through questionnaires and interviews that had been used for a preliminary assessment to assist in developing targeted and focused health promotion programs.

In the social assessment phase, a sample of 56 Vietnamese students was assessed by using a questionnaire. The quality of life of the Vietnamese student was 55.86. Among the sub-domains, the social relationships domain had the highest mean score at 57.43 ± 6.34, followed by the psychological health domain at 54.15 ± 5.86, the environmental health domain at 52.68 ± 6.71, and finally, the physical health domain at 50.69 ± 6.49.

The stress level was assessed in the epidemiologic, behavioral, and environmental assessments phase. In addition, the researcher behavior factors (health promotion lifestyle) among Vietnamese students for this phase. Epidemiologic, behavioral, and environmental assessments phase were conducted with questionnaires. The subjects' health promotion behaviors ranged from 48 to 136, and the average score was 131.69. In the sub-categories, the highest mean score was for interpersonal relations at 23.12 points, followed by spiritual growth at 22.18 points; health responsibility at 21.26 points; nutrition at 20.89 points; stress management at 19.87 points, physical activity at 19.09 points. The average score for stress was 27.23.

In the ecological and educational assessment phase, researchers determine the predisposing, enabling and reinforcing factors that influence the students to the health promotion behavior within their environment through questionnaires. Disposition factors include health perception, health knowledge, responsibility, self-efficacy, and self-esteem. Among these factors, health perceptions as preparing factors for health promotion behaviors. Health perception directly motivates health behavior, and it has been shown to be a related factor in helping improve physical activity levels and students' health-promoting lifestyle in several studies (Ahn et al., 2014; Hwang & Oh, 2020; Kim et al., 2015; Kim & Kim, 2018), so it was included in this study. Social support, peer influence, advice, and health care providers' feedback are reinforcing factors. Social support helps improve healthy behaviors (Anh et al., 2021; Bender et al., 2019; Bhochhibhoya, Dong, & Branscum, 2017; Hwang & Oh, 2020; Jeong & Song, 2018). Furthermore, the enabling factors for health promotion behaviors included sufficient skills for health promotion. In this study, the accessibility of healthcare services is an enabling factor (Barnekow et al., 2006; Hunt & Eisenberg, 2010). As a result of the assessment in this phase, health perception ranged from 12 to 120, with an average was 109.68. The average score for social support was 42.6. The average score for accessibility of healthcare services was 42.86 (Table 2).

Table 2. Assessment of dependent variables on PRECEDE phases

(N=56)

PRECEDE phases	Variables	M±SD	Range (min~max)
Phase 1 Social assessment	Quality of life		
	Total	55.86 ± 6.48	30~78
	Physical health	50.69 ± 6.49	20~70
	Psychological health	54.15 ± 5.86	40~68
	Social relationships	57.43 ± 6.34	24~64
	Environmental health	52.68 ± 6.71	18~54
Phase 2 Epidemiological, behavioral, and environmental assessment	Health promotion behaviors		
	Total	131.69 ± 16.34	48 ~136
	Physical activity	19.09 ± 4.34	8~22
	Nutrition	20.89 ± 4.21	10~24
	Health responsibility	21.26 ± 3.89	13~26
	Stress management	19.87 ± 4.76	10~20
	Interpersonal relations	23.12 ± 4.97	8~24
	Spiritual growth	22.18 ± 3.78	9~28
	Stress	27.23 ± 4.89	18~34
Phase 3 Educational and ecological assessment	Health perception	109.68 ± 18.54	12~120
	Social support	42.69 ± 4.01	32~50
	Health care services access	42.86 ± 4.06	32~48

M=mean; SD=standard deviation.

The administrative and policy assessment and intervention alignment were made through interviews to discover resources, organizational barriers and facilitators, and policies needed for implementation and sustainability program. In this study, the health care center characteristics were identified. The availability and accessibility of health promotion education programs and policies and personnel for health promotion were analyzed and assessed through interviews and field surveys at health care center in the university. Besides, student focus groups and interviews were conducted, and the main contents are

as follows.

"We must compulsory to take out insurance for foreigners. But I don't fully understand the benefits of insurance. I want a general health check but don't know the procedure and fear the cost".

"When I have a health problem, I don't know which hospital to treatment....because Korean, not good, cost concerns, and medical examination procedures."

"I had to hire an interpreter when I went to the doctor..cost a lot..."

"I'm worried about my health because I've been to Korea for three years and still haven't had a medical check-up."

"I know the health care center, but I have never been there. I'm afraid of conversation and don't know the procedure."

Students think they have good health, so they don't care about how to improve their health. *"I feel that my health is very good now. Even though I worked all night, I got used to it." "I found maintaining my health to be a bit of a challenge, as I don't have time to cook."*

Regarding educational strategies, focus groups and interviews show that international students studying in Korea enroll in university after completing the Korean language course. However, during the orientation session, students were only given an overview of the healthcare center. After that, there are no educational or health promotion programs for students. For example, recently, there is also no health-related education for Vietnamese students, and they lack information about how to use and the benefits of health insurance. Therefore, it can be found that health education and health promotion programs for students are inadequate. Additionally, lack of information and communication skills are causing available access and use of available resources.

In the administrative and policy assessment stage, the environment of the Vietnamese students was considered. Students live in different locations and

have schedule differences. Therefore, a flexible training schedule was formed, and the program was conducted from 10:00 am to 11:00 am on Fridays or weekends by reflecting the demand survey among students. For the convenience of students participating in the program, we have chosen the international lounge where the program takes place. As a result of the demand survey, all students wanted to provide information about health insurance and how to use health centers. An instructor from the healthcare center provided information about health insurance and available resources for students.

(2) Review previous studies

Literature analysis was conducted to analyze factors affecting health promotion behavior, quality of life, and related factors in international students in Korea and other countries. Review previous studies based on online databases with keywords such as student, health promotion education program, health promotion behavior, stress program, physical activity program, and quality of life were conducted.

(3) Intervention program planning and pilot study

After reviewing the literature and based on the results obtained through preliminary assessment, a needs assessment on the PRECEDE phase, a health promotion program was developed and presented in table 3. According to campus impact research, the campus environment, healthcare center, and convenient facilities play an essential role in providing various student activities to promote health on the university campus (Saheb, Mortimer, Rutherford, Sperandei, & Reis, 2021). Moreover, the campus culture plays an important role in supporting students' understanding of unfamiliar cultural traditions and cultural adaption (Shen & Tian, 2012). Therefore, in this study, CamHPP integrated with the university policies and linked with the campus healthcare center to develop a health program that is both tailored and specific to

students' health needs and wants. The health promotion program was based on the six areas of health promotion lifestyle suggested by Walker et al. (1995), cultural adaption, and healthcare services. CamHPP includes an educational program, a stress management program, and an exercise program.

The educational program included education on health perceptions, nutrition, social support, interpersonal relations, effective communication, spiritual growth, stress management, physical activity, healthy habit, leisure activities, cultural adaptation, and education about the use of healthcare services. Participants learned about lifestyle modification through lectures, experience sharing, discussion, and feedback. The researcher provided a daily log and asked participants to record the amount and types of daily physical activities they performed, the frequency of lifestyle modification practices, and nutrition (including water intake and the name of the food consumed written in a diary). During group education sessions, the researcher reviewed participants' daily logs and dietary evaluations and set-individualized goals based on each participant's amount and intensity of physical activities and lifestyle modification practices during the past week.

Students cannot avoid stress during their education abroad. Nevertheless, they can make it a goal to keep everyday stress low. In order to have a lifestyle in that oneself can be managed stress, from weeks 5 to 8 of the program, small group training was conducted for about 10 minutes by selecting one of the deep breathing method, the imagery method, the thinking stop method, and the muscle relaxation method.

In this study, the physical activity program is walking and badminton with Cashwalk app. Practice time was 2 hours a week after school with badminton. In addition, participants can participate when they have free time. In addition, participants can participate when they have free time, and they can join at least once a week in addition to the walking program. A pilot study was conducted on 10 Vietnamese students who met the criteria for selecting

subjects in this study to understand the suitability of the questionnaire and measurement tools before the application program.

Table 3. Intervention program plan for Vietnamese students

Session	Components	Predisposing	Reinforcing	Enabling	Strategies	Contents of education	Process evaluation	Impact evaluation	Outcome evaluation
1st (60 min)	• Health perceptions • Responsibility • Self-esteem and self-efficacy	• Health perceptions			• Group education • Discussion group • Individual telehealth coaching	• Program introduction • Health perceptions and responsibility, risk factors, and healthy lifestyle behaviors. • The personal responsibility to care for each one health. • Self-esteem and self-efficacy in health promotion	Health perceptions	Health promotion behavior	Quality of life
2nd (40 min)	• Accessibility to healthcare service			• Accessibility to healthcare service	• Sharing, discussion • Needs-based support • Group education • Individual telehealth coaching	• Identifying needs and barriers • Information on health care services on the campus, Korea healthcare system. • Health insurance for international students • Maintaining support for individuals and groups	Accessibility to healthcare service		Quality of life

(Table continued)

Table 3. (Continued)

Session	Components	Predisposing	Reinforcing Enabling	Strategies	Contents of education	Process evaluation	Impact evaluation	Outcome evaluation
3rd (50 min)	Adequate and balanced nutrition	Health knowledge		• Sharing and discussion group • Group education • Individual telehealth coaching	• Understanding eating habits and healthy nutrition • Balanced and unbalanced diet and their consequences • Basic food groups, food safety, hygiene, and age-appropriate nutrition • Challenges of eating and maintaining a healthy diet when studying in Korea.		Health promotion behavior	• Quality of life • Biochemical indicators
4th (50 min)	Physical activity	Health knowledge		• Group education • Sharing, discussion group • Practice physical activity • Individual telehealth coaching	• Physical activity and body consequences • Exercise program: Badminton group, a walking program with a pedometer app (target goal of 10,000 steps/day, equivalent to 30 minutes of walkings/day)		Health promotion behavior	• Quality of life • Biochemical indicators

(Table continued)

Table 3. (Continued)

Session	Components	Predisposing	Reinforcing	Enabling	Strategies	Contents of education	Process evaluation	Impact evaluation	Outcome evaluation
5th (50 min)	Stress management	Health knowledge			• Group education • Practice stress management technique • Individual telehealth coaching	• Stress awareness • Understanding the subject's response to stress • Finding a solution to stress • Deep breathing, imagery, the thinking stop method, muscle relaxation		Perceived stress	• Quality of life • Biochemical indicators
6th (40 min)	• Social support • Interpersonal relations and effective communication		Social support		• Group education • Sharing and discussion group • Buddying scheme and peer group • Individual telehealth coaching	• Role of social support when living and studying abroad • Communication in the interpersonal relations • Nurturing relationships, cultivating and dultivating social support networks	Social support		Quality of life

(Table continued)

Table 3. (Continued)

Session	Components	Predisposing	Reinforcing	Enabling	Strategies	Contents of education	Process evaluation	Impact evaluation	Outcome evaluation
7th (40 min)	Healthy habits, leisure activities, and cultural adaptation	Health knowledge	Social support		• Group education • Sharing and discussion group • Buddying scheme and peer group. • Individual telehealth coaching	• Healthy Habits • Leisure activities and culture-related activities • Cultural adaptation; acculturation affect the health behavior of international students. • Maintain individual and group support	Social support		Quality of life
8th (50 min)	A healthier tomorrow	Health knowledge			• Sharing and discussion group • Individual telehealth coaching	• Integrating health promotion into the everyday life • Maintain healthy lifestyles		Health promotion behavior	• Quality of life • Biochemical indicators

(4) Evaluation of the validity and final health promotion program

After drafting the health promotion program, the appropriateness of the program contents was evaluated by an expert group; one nursing professor, one officer in charge, and one nurse of the health care center in the university. The expert group provided an opinion on the duration of the program, the suitability of the overall program configuration, applicability, and any other parts that need to be added or removed. The expert also gave the advice to include a pedometer was added to strengthen motivation and objective results for promoting physical activity. Content validity test based on content validity index (CVI) consisting of a scale of 4 (1=invalid, 2=somewhat valid, 3=valid, 4=very valid). The percentage of experts rated with either 3 or 4 points was calculated, and if it was more than 80%, it was approved. As a result, the overall CVI was 1.00, and all experts rated the CamHPP to be appropriate.

The final CamHPP was revised and modified to reflect the expert's advice (appendix 5). A pedometer app-Cashwalk app was offered to all participants to encourage self-monitoring during physical activities in daily activities. Especially the feature of the Cashwalk app with monetary rewards that allow the participant to earn money just for walking or running. The students were encourageda to achieve a goal of 10,000 steps per day and were informed that this value was roughly equivalent to 30 minutes of walking per day along with their everyday activities.

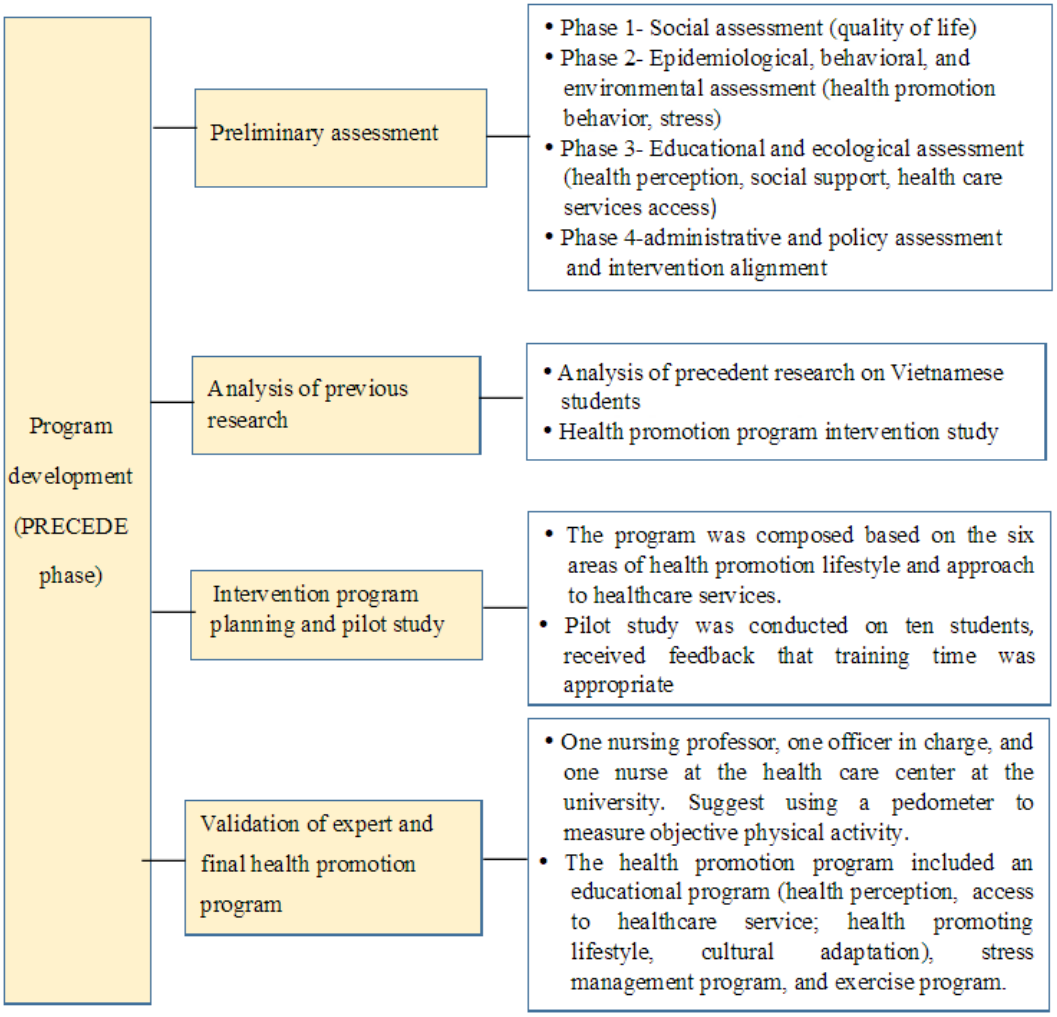

Figure 6. The process of development of a CamHPP

2) Training of a research assistant

The researcher coordinated the program with the help of one supportive assistant researcher who worked together in every session. The researcher educated and trained the research assistant to collect data during the pre-test and the post-test. The training contained information on the purpose, study contents, ethical considerations, procedure, and how to record the physical activity. The research assistant was not able to know which group the students belonged to in the study.

3) Pretest

The researcher explained the purpose and method of the study. All information provided by the research subjects is kept confidential and private; the information is used only for research purposes. A participant can leave a research study at any time. The participants must write the informed consent form to participate in the study. A questionnaire was conducted, and it took about 25 -30 minutes to complete. The researcher received the previous week's step-count data on the app pedometer-Cashwalk. And blood test was conducted. Both the experimental and control group used the same measurements to assess the pre-test at the same time.

4) Implementation of a CamHPP

The effects of variables measured in the epidemiologic, behavioral, environmental and educational, ecological and administrative, and policy evaluation processes of the PRECEDE stage on the quality of life were verified. In the PROCEED stage, the health promotion program was evaluated as follows (Figure 6).

After obtaining research approval from the Institutional Review Board and participant consent, the experimental group was conducted from June 1st, 2022, to September 15th, 2022, at the international lounge, K University, D

city. The health promotion program was conducted with each session held once a week, and the program was held during eight sessions. The discussion topic focuses on health-promoting lifestyle areas and the influence factors such as health perceptions, HPB, stress management, accessibility to healthcare services, healthy habits, leisure activities, cultural adaptation, and social support issues. As part of the program, group intervention, individual intervention, telephone counseling, text message reminders, and a diary were provided to the participant. The group intervention was conducted in the International lounge at the university for 40- 60 minutes every week for eight sessions. Telephone counseling and reminder text message were provided between each session. Telephone counseling lasted around ten minutes, and a text message was sent to remind them of the date and time of the HPP and to give them a cue to exercise. The control group was instructed in general health education for health maintenance (60 minutes).

In the assessment of process and the impact phase, and the assessment of outcome phase, during the implementation of the health promotion program, the change in predisposing factors, enabling factors, and reinforcing elements of participants, and change in outcome was assessed by measurements before and after the intervention.

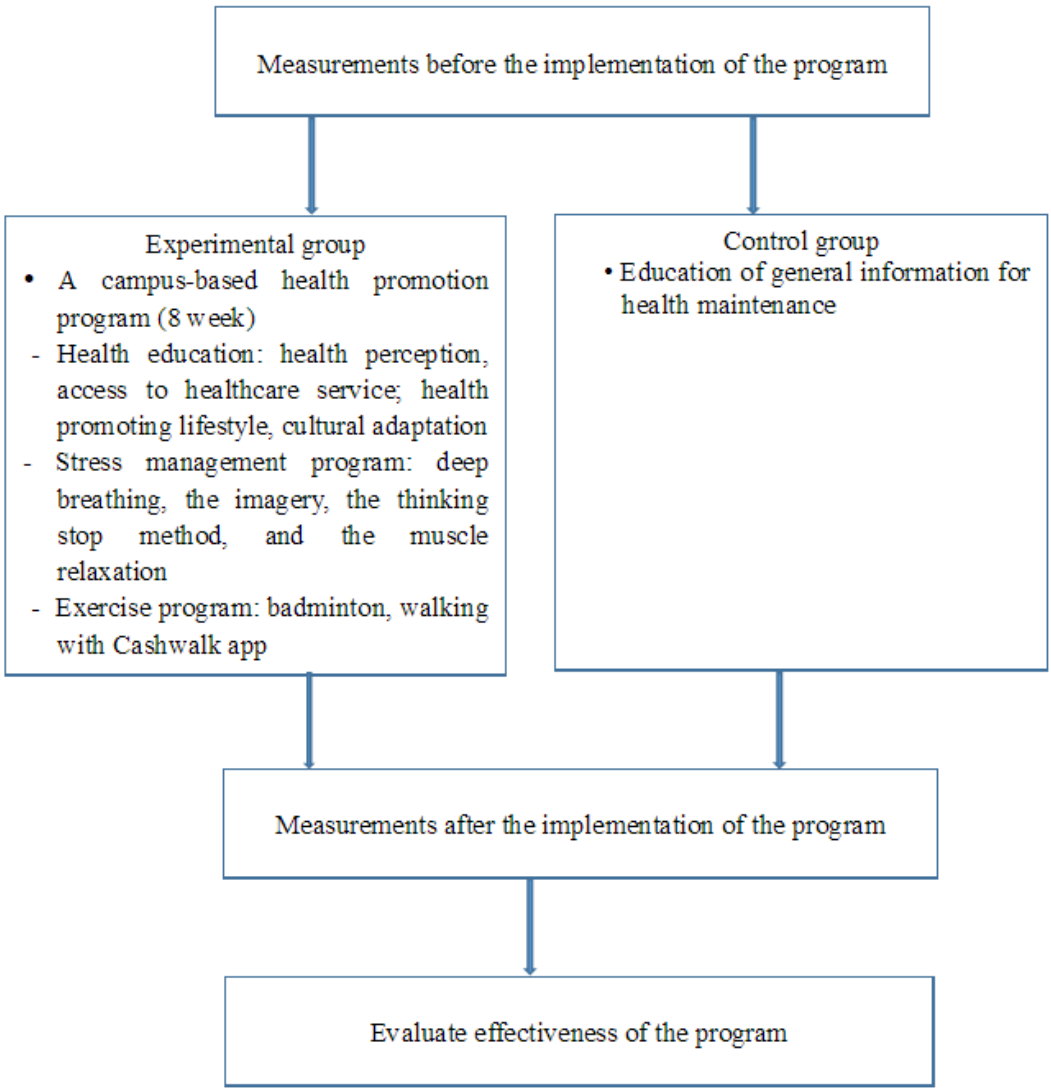

Figure 7. The process of evaluation of a CamHPP

5) Posttest

After eight weeks, the campus-base health promotion program was over, a posttest was conducted with the same contents as the pretest phase, and the research assistant was conducted with the same measurement items as in the pretest phase.

5. Ethical considerations

After obtaining approval from the Institutional Review Board (IRB) of K University in Daegu (IRB. No. 40525-202112-BR-089-04) the research was conducted. Participants were recruited through an announcement that specifically stated the overall study, such as program name, research purpose, research period, research location, participation qualification, and incentives. Before the pretest started, each informant was given an informed consent form (Appendix B).

6. Data analysis

Statistical analysis was performed using the IBM SPSS program for Windows version 20.0. The general characteristics of the students have been expressed as percentages, mean and standard deviation. The Chi-square test, T-test, Fisher's exact test (expected frequency was less than 5), and Mann-Whitney test was used to verify prior homogeneity of the general characteristics of the experimental group and control group. The Mann–Whitney U test for intergroup comparisons and Wilcoxon signed-rank test for intragroup comparisons were used. $p<0.05$ was considered statistically significant. Cronbach's alpha was used to assess the reliability of the measurement tools.

IV. Results

This study was developed and applied to a CamHPP for Vietnamese students in Korea based on the PRECEDE-PROCEED with results as follows.

1. Homogeneity test for general characteristics

In order to verify the homogeneity according to the subjects' general characteristics, a chi-square test was performed for a categorical variable. If the number of cells having (25%) expected frequency was less than 5, Fisher's exact test was performed. A total of 55 students (experimental group of n=27, control group of n=28) participated in this study. The intervention and control groups were homogeneous in terms of variables. As shown in Table 4, no statistically significant difference was found between the two groups. The average age of the participants in the experimental group was 24.54±3.33 years. The majority were female in the experimental group (77.8%) and in the control group (75.0%). The number of Vietnamese students in the experimental group in undergraduate programs was 23 (85.2%). Almost all Vietnamese students in the experimental group lived on their personal earnings (88.9%). The average age of students in the control group was 24.31±2.68. Most of the participants in the control group (57.2%) lived in a studio. There were no significant differences between the experimental and control groups in the general characteristics.

Table 4. Homogeneity test for general characteristics

(N = 55)

Variables		Exp. (n=27)	Cont. (n=28)	Total	χ^2 or t	*p*
		n (%) or M±SD	n (%) or M±SD	n (%) or M±SD		
Sex	Men	6 (22.2)	7 (25.0)	12 (21.8)	0.33	.562
	Women	21 (77.8)	21 (75.0)	43 (78.2)		
Age (years)		24.71 ± 3.04	24.31 ± 2.68	24.54 ± 3.33	0.35	.331
Housemate	Yes	9 (33.3)	7 (25.0)	16 (29.1)	0.43	
	No	18 (66.7)	21(75.0)	39 (70.9)		.670
Education status	Undergraduate	23 (85.2)	25 (89.3)	48 (87.3)	3.9	
	Graduate	4 (14.8)	3 (10.7)	7 (12.7)		.263*
Korean proficiency (TOPIK)	Intermediate (level 3,4)	13 (48.2)	24 (85.7)	37 (67.3)	0.09	.772*
	Advanced (level 5,6)	11 (40.7)	4 (14.3)	15 (27.2)		
	No	3 (11.1)	0(0)	3 (5.5)		
Length of stay in Korea (year)	<1	2 (7.4)	5 (17.9)	7 (12.7)	1.8	.614*
	1-3	23 (85.2)	22 (78.5)	45 (81.8)		
	>3	2 (7.4)	1 (3.6)	3 (5.5)		
Residence type	Studio	16 (59.3)	16 (57.2)	32 (58.2)	4.04	.248
	Others	11 (40.7)	12 (42.8)	23 (41.8)		
Source of living expenses	Own	24 (88.9)	22 (78.6)	46 (83.6)	4.0	.257*
	Others	3 (11.1)	6 (21.4)	9 (16.4)		

* Fisher's exact test

Exp.=experimental group; Cont.=control group; M=mean; SD=standard deviation; TOPIK: The test of proficiency in Korean.

2. Homogeneity test for the dependent variables

In order to verify the homogeneity of the dependent variable of the experimental group and the control group before applying for the health promotion program, a Mann-Whitney test was performed (Table 5).

As a result, there was no significant difference between the groups. Therefore it can be concluded that the composition of the groups was appropriate. The Health perceptions were 108.7 points in the experimental group, 110.11 points in the control group, 42.04 points in the experimental group and 41.93 points in the control group for social support. Overall HPLP was 130.01 points in the experimental group and 130.17 points in the control group. There were no significant differences between the two groups in the frequency of TG, Cholesterol, HDL-C, LDL-C, Hgb, Hct, WBC, RBC and serum cortisol. The average quality of life score was 55.78 in the experimental group, and the control group was 56.75, and there was no significant difference between the two groups. Before the intervention, there were no statistically significant differences in any variables between the intervention and control groups, thus ensuring homogeneity between the groups.

Table 5. Homogeneity test for dependent variables

(N = 55)

Variable	Exp.(n=27)	Cont.(n=28)	Total	U	*p*
	M±SD	M±SD	M±SD		
Health perceptions	108.7±24.45	110.11±23.02	109.45±23.5	278.50	.778
Social support	42.04±5.10	41.93±4.36	41.98±4.69	120.00	.124
Health care services access	43.16±4.07	42.29±4.15	42.28±4.37	316.00	.287
Overall HPLP	130.01±14.91	130.17±16.09	130.05±15.49	167.50	.312
Objective PA score (steps/day)	5128.68±3025.78	5283.10±2728.69	5105.89±2987.65	373.00	.887
Perceived stress	28.18±4.87	28.22±4.16	28.2±4.84	220.50	.668
TG (mg/dL)	103.56±51.13	105.07±64.46	101.35±57.8	160.00	.952
TC (mg/dL)	173.11±51.85	169.0±28.89	168.27±41.6	167.50	.174
HDL-C (mg/dL)	54.15±11.63	51.82±10.55	52.90±11.05	145.00	.413
LDL-C (mg/dL)	103.48±26.37	103.89±34.61	103.6±30.55	147.50	.078
Hb (g/dL)	13.34±1.21	13.83±1.33	13.59±1.29	136.50	.923
Hct (%)	42.7±3.31	43.73±3.80	43.21±3.57	145.00	.634
WBC (thous/uL)	6.93±1.65	7.34±1.41	7.14±1.53	135.00	.422
RBC (mill/uL)	4.69±0.43	4.82±0.64	4.75±0.54	123.00	.250
Serum cortisol (μg/dL)	11.15±4.92	10.57±5.35	10.84±5.11	136.00	.741
Quality of life	55.78±4.41	56.75±5.57	56.27±5.01	146.00	.520

Exp.=experimental group; Cont.=control group; M=mean; SD=standard deviation; HPLP= health-promotion lifestyle profile; PA= physical activity; TG= triglyceride; TC= total cholesterol; HDL-C= High density lipoprotein cholesterol; LDL-C=low density lipoprotein cholesterol; Hb= hemoglobin Hct= hematocrit; WBC=white blood cell; RBC=red blood cell.

3. Hypothesis testing

1) Hypothesis 1: The experimental group will show higher level of health perception than the control group.

After the CamHPP was implemented, the health perception was 108.71±24.45 on the pretest and 115.36±14.45 on post-test (z=-3.04, *p*=.023) in the experimental group, and the health perception was 110.11±23.02 on pretest and 110.58±16.55 on posttest (z=-0.20, *p*=.687) in the control group, indicating a difference between groups in the experimental group. Besides, as a result of comparing the pretest-posttest between the experimental group and the control group, the experimental group was -6.66±12.45, and the control group was -0.47±14.67, indicating a significant difference between the groups (U=224.00, *p*=.033). Thus, the first hypothesis was supported (Table 6).

Table 6. Effect of CamHPP on changes in health perception

(N = 55)

Group	Pretest	Posttest	z	*p*	Pre-Post	U	*p*
	M±SD	M±SD					
Exp. (n=27)	108.71±24.45	115.36±14.45	-3.04	.023	-6.66±12.45	224.00	.033
Cont. (n=28)	110.11±23.02	110.58±16.55	-0.20	.687	-0.47±14.67		

Exp.=experimental group; Cont.=control group; M=mean, SD=standard deviation.

2) Hypothesis 2: The experimental group will show higher level of social support than the control group.

After the implementation of the CamHPP on Vietnamese students, the social support score of the experimental group increased by 3.99 points, from 46.03 points to 46.03 points after the intervention (z=-3.97, *p*<.001), but the

control group decreased by 0.30 points from 41.93 points to 41.60 points on the posttest. There was no significant difference between the pre-test and post-test in the control group (Z=-0.94, p=.712). As a result of analyzing the change in score with the Wilcoxon Signed Rank test, the social support score of the experimental group increased significantly on the posttest than the pretest and there were differences between the two groups (U=165.50, p<.001). Thus, the second hypothesis was supported. (Table 7).

Table 7. Effect of the Cam HPP on changes in social support

(N = 55)

Group	Pretest	Posttest	z	p	Pre-Post	U	p
	M±SD	M±SD					
Exp. (n=27)	42.04±5.10	46.03 ±5.80	-3.97	<.001	-3.99±4.67	165.50	<.001
Cont. (n=28)	41.93±4.36	41.60±4.72	-0.94	.712	0.33±3.58		

Exp.=experimental group; Cont.=control group; M=mean; SD=standard deviation.

3) Hypothesis 3: The experimental group will show higher level of health care services access than the control group.

After the implementation of the CamHPP, in the experimental group, the health care services access was 43.16±4.07 before and after intervention 52.48±4.24 (z=-3.68, p<.001). There were differences between before and after intervention in the experimental group. The health care services access score was 42.29±4.15 on the pretest and 42.86±4.21 on the posttest in the control group (z=-0.87, p=.762). As a result of comparing the pretest-posttest between the experimental group and the control group showed a significant difference between the groups (U=350.50, p=.024). Thus, the third hypothesis was supported (Table 8).

Table 8. Effect of the CamHPP on changes in health care services access

(N = 55)

Group	Pretest	Posttest	z	*p*	Pre-Post	U	*p*
	M±SD	M±SD					
Exp. (n=27)	43.16±4.07	52.48±4.24	-3.68	<.001	-9.32±4.47	350.50	.024
Cont. (n=28)	42.29±4.15	42.86±4.21	-0.87	.762	-0.57±4.28		

Exp.=experimental group; Cont.=control group; M=mean; SD=standard deviation.

4) Hypothesis 4: The experimental group will show higher level of health promotion behavior than the control group.

After the implementation of the CamHPP, the results of the Mann-Whitney test showed that no significant difference was found in the control group for HPLP (z=-1.51, *p*=.340) between the pretest and posttest. While the experimental group who gets the intervention program showed that HPLP score increased by 24.69 points, from 130.01 points to 154.70 points after the intervention (z=-4.30, *p*<.001). After the implementation of the CamHPP for Vietnamese students, the HPLP score of the experimental group increased significantly and there were differences between the two groups (U=148.00, *p*<.001). The mean score of students in six subscales of the health promotion program after the intervention was significantly higher compared to before the intervention in the experimental group. The physical activity subjective and objective scores of the experimental group increased significantly, and there were differences between two groups (U=160.00, *p*=.034; U=484.50, *p*<.001). As a result of comparing the pretest-posttest between the experimental group and the control group indicated a significant difference between the groups. Thus, the fourth hypothesis was supported (Table 9).

Table 9. Effect of the CamHPP on changes in health promotion behavior

(N=55)

Variables	Group	Pretest M±SD	Posttest M±SD	z	*p*	Pre-Post	U	*p*
HPLP	Exp. (n=27)	130.01±14.91	154.70 ±6.01	-4.30	<.001	-24.69±14.89	148.00	<.001
	Cont. (n=28)	130.11±16.09	131.54±5.35	-1.51	.340	-1.43±15.21		
PA	Exp.	20.22±1.89	25.89±2.91	-5.24	<.001	-5.67± 1.36	160.00	.034
	Cont.	20.06±1.62	20.75±2.45	-1.36	.223	-0.69±1.87		
Nutrition	Exp.	20.41±2.34	26.96 ±2.28	-2.47	.021	-6.55±2.37	85.50	.001
	Cont.	20.04±1.92	21.89±2.30	-0.04	.648	-1.85±3.58		
Health responsibility	Exp.	21.74±1.67	24.56 ±1.48	-2.17	.035	-2.82±1.37	135.50	.032
	Cont.	22.61±2.34	22.69±2.15	-0.05	.728	-0.08±2.18		
Stress management	Exp.	17.19±2.37	22.59±2.24	-4.66	.005	-4.69±1.89	257.00	.013
	Cont.	18.04±2.29	18.89±2.84	-1.78	.079	-0.85±1.45		
Interpersonal relations	Exp.	23.07±2.20	26.76 ±2.28	-2.87	.038	-3.69±2.17	235.00	.012
	Cont.	23.39±2.06	23.29±1.98	-1.04	.682	0.10±1.89		
Spiritual growth	Exp.	23.15±2.38	25.62 ±2.58	-1.67	.030	-2.47±2.43	250.50	.042
	Cont.	23.61±2.64	23.89±2.50	-0.40	.852	-0.28±1.98		
Objective PA (steps/day)	Exp.	5128.68±3025.78	6749.51±2690.14	-2.96	.003	-1620.83±2890.61	484.50	<.001
	Cont.	5283.10±2728.69	5624.68±2830.30	-0.84	.834	-341.58±2568.90		

Exp.=experimental group; Cont.=control group; M=mean; SD=standard deviation; HPLP= health promotion lifestyle profile; PA= physical activity.

5) Hypothesis 5: The experimental group will show lower level of perceived stress than the control group.

After completing the CamHPP, the score of perceived stress on the posttest was significantly decreased compared to the score on the pretest in the experimental group. As a result of comparing the pre-post difference between the experimental group and the control group, the experimental group was 4.84±4.21 and the control group was -0.42±3.67, indicating a significant difference between the groups (U=280.50, *p*=.014). Thus, the sixth hypothesis was supported (Table 10).

Table 10. Effect of the CamHPP on changes in perceived stress

(N=55)

Group	Pretest	Posttest	z	*p*	Pre-Post	U	*p*
	M±SD	M±SD					
Exp. (n=27)	28.18±4.87	23.34± 5.13	-3.11	.033	4.84±4.21	280.50	.014
Cont. (n=28)	28.22±4.16	28.64±4.78	-1.45	.682	-0.42±3.67		

Exp.=experimental group; Cont.=control group; M=mean; SD=standard deviation.

6) Hypothesis 6: The experimental group will show optimal level of lifestyle-related biochemical indicators than the control group.

After completing the CamHPP, the results showed that the complete blood count (Hb, Hct, WBC, RBC) after the intervention of a health promotion program differed between the groups. However, as a result of comparing the pre-post difference between the experimental group and the control group for Hgb, Hct, WBC, and RBC; there were no statistically significant differences between the groups (U=170.00, *p*=.241; U=139.00, *p*=.158; U=81.00, *p*=.313; U=218.00, *p*=.464; respectively). Besides, the mean pretest score for triglyceride in the experimental group was 103.56±51, and the average posttest score was

90.65±34.88 while in the control group, the pretest triglyceride level was 105.07±64.46, the posttest was 110.14±56.33. There was a statistically significant difference between the experimental group and the control group on the average score for triglyceride (U=135.00, p<.001). Total cholesterol decreased significantly from 173.11 to 164.52 in the experimental group (z=-6.78, p=.004), and HDL-C was 58.14±9.84 in the experimental group and 54.15±11.63 in the control group after intervention. The average score for LDL-C significantly decreased from 103.48 to 96.56 in the experimental group (z=-5.13, p=.018). There was a statistically significant difference between the experimental and control groups on the average score for total cholesterol, HDL-C, and LDL-C (U=230.00, p<.001; U=125.50, p=.042; U=215.00, p<.001, respectively). In this study, the blood lipid index (TG, TC, HDL-C, LDL-C) had a significant difference between the groups after the intervention of the health promotion program. The Mann-Whitney test results showed no significant difference in the control group for serum cortisol score (z=-1.18, p=.860) between the pretest and posttest. While the experimental group who gets the intervention program showed that the serum cortisol score decreased by 2.03 points, from 11.15 points to 9.12 points after the intervention (z=-2.12, p=.038). As a result of comparing the pre-post difference between the experimental group and the control group, the experimental group was 2.03±3.98 and the control group was -1.61±487, indicating a significant difference between the groups (U=134.00, p=.043). Thus, the fifth hypothesis was partially supported.

Table 11. Effect of the CamHPP on changes in biochemical indicators

(N=55)

Variables	Group	Pretest M±SD	Posttest M±SD	z	*p*	Pre-Post	U	*p*
Hb (g/dL)	Exp. (n=27)	13.34±1.21	14.86 ±1.16	-2.52	.061	-1.52±0.98	170.00	.241
	Cont. (n=28)	13.83±1.33	13.98 ±1.31	-0.89	.672	-0.15±1.59		
Hct (%)	Exp.	42.70±3.31	43.89 ± 2.97	-3.71	.082	-1.19±2.57	139.00	.158
	Cont.	43.73±3.80	43.61 ± 3.66	-0.05	.834	0.92±3.67		
WBC (thous/uL)	Exp.	6.93±1.65	7.61±1.37	-0.46	.123	-0.62±1.68	81.00	.313
	Cont.	7.34±1.41	7.63±1.89	-0.16	.487	-0.29±1.62		
RBC (mill/uL)	Exp.	4.69±0.43	4.79±0.38	-0.20	.162	-0.10±0.42	218.00	.464
	Cont.	4.82±0.64	4.86±0.61	-0.08	.740	-0.04±0.56		
TG (mg/dL)	Exp.	103.56±51.13	90.65±34.88	-4.23	.012	12.91±32.71	135.00	<.001
	Cont.	105.07±64.46	110.14±56.33	-3.55	.273	-5.07 ±54.73		
TC (mg/dL)	Exp.	173.11±51.85	164.52±45.8	-6.78	.004	8.58±44.87	230.00	<.001
	Cont.	169.01±28.89	177.04±33.05	-2.15	.381	-8.04± 31.2		
HDL-C (mg/dL)	Exp.	54.15±11.63	58.14±9.84	-3.25	.013	-3.99±10.89	125.50	.042
	Cont.	51.82±10.55	53.72±13.22	-1.65	.324	-1.90±11.87		
LDL-C (mg/dL)	Exp.	103.48±26.37	96.56±24.01	-5.13	.018	6.92±26.78	215.00	<.001
	Cont.	103.89±34.61	111.85±28.3	-7.96	.081	-7.96±31.45		
Serum cortisol (μg/dL)	Exp.	11.15±4.92	9.12±4.19	-2.12	.038	2.03±3.98	134.00	.043
	Cont.	10.57±5.35	12.17±4.91	-1.18	.860	-1.61±487		

Exp.=Experimental group; Cont.=Control group; M=mean; SD=standard deviation; Hb= Hemoglobin; Hct= Hematocrit; WBC=white blood cell; RBC=Red blood cell; TG= Triglyceride; TC= Total cholesterol; HDL-C= High density lipoprotein cholesterol; LDL-C= Low density lipoprotein cholesterol.

7) Hypothesis 7: The experimental group will show higher level of quality of life than the control group.

After the CamHPP, in the experimental group, the quality of life score was 55.78±4.41 before and after intervention 67.70 ±6.01 (z=-4.31, p<.001) differences between before and after intervention in the experimental group. The quality of life score was 56.75±5.57 on the pretest and 58.54±5.35 on the posttest in the control group (z=-1.40, p=.338). As a result of comparing the pretest-posttest between the experimental group and the control group showed a significant difference between the groups (U=248.00, p<.001). Therefore, hypothesis seventh was supported (Table 12).

Table 12. Effect of the CamHPP on changes in quality of life

(N=55)

Group	Pretest	Posttest	z	*p*	Pre-Post	U	*p*
	M±SD	M±SD					
Exp. (n=27)	55.78±4.41	67.70 ±6.01	-4.31	<.001	-11.92±4.89	248.00	<.001
Cont. (n=28)	56.75±5.57	58.54±5.35	-1.40	.338	-1.79±5.21		

Exp.=experimental group; Cont.=control group; M=mean; SD=standard deviation.

V. Discussion

This study aims to develop and apply a CamHPP based on the PRECEDE-PROCEED model to Vietnamese students in Korea and to examine its effects on health perception, social support, health care services access, health promotion behavior, perceived stress, biochemical indicators and quality of life. This chapter discusses the development of CamHPP and the evaluation of the program for Vietnamese students in Korea.

1. Development of a health promotion program for Vietnamese students in Korea

The 8 week CamHPP for Vietnamese students was developed based on the result of the assessment using the PRECEDE-PROCEED model. A health promotion program aims to promote long-lasting change, help students improve their health outcomes, and maintain behavior change.

The CamHPP for Vietnamese students consists of six areas of health promotion lifestyle, use of healthcare services, and considering cultural adaptation for Vietnamese students. Most previous studies find they need at least 8 weeks for people to form a new habit and maintain a change in behavior (Lee et al., 2006; Tsai, 2020). Therefore in this study intervention period was 8 weeks is necessary. Six areas of health promotion lifestyle, including health responsibility, nutrition, physical activity, stress management, interpersonal relations, and spiritual growth, were used as the basic contents of this program. Previous studies have also used six aspects of health promotion lifestyle as the main content in intervention programs to improve health

behavior for college students (Brett, 2020; Min & Paek, 2007; Park, 2011; Solhi et al., 2021; Ulla Díez et al., 2012). In this study, CamHPP was implemented by integrating with the university policies, using the available resources in the university, and linking with the campus healthcare center into the program. Through the CamHPP, students collaborated with health professionals at the campus healthcare center to create outreach and activities to help improve students' health-related quality of life. Vietnamese students move to a new socio-cultural environment; they may be unfamiliar with the host culture. Although Korean and Vietnamese cultures have many similarities. However, there as well as differences, such as climate, food, language and culture. Vietnamese students experience a lot more cultural stress than Chinese students, who experience accumulated pressure to adapt to their new environment (Anh et al., 2021; Sun, 2018; Thuy, 2017). The ability to adapt to new cultures is affirmed as an important determinant of health for students (Akinola, 2014; Alloh, Tait, & Taylor, 2018; Jeong & Song, 2018). Moreover, students face barriers to accessing healthcare services, and delays in seeking healthcare services may result in severe health outcomes (Kwak, 2022; Masai, et al., 2021). Therefore, along with health promotion lifestyles, cultural adaptation integrated and instructions for the use of healthcare services on the campus as well as using the healthcare system in Korea were implemented.

From the operational aspect of the intervention, most of the interventions in previous studies were in the form of group education with a lecture format (Korn et al., 2017; Min & Paek, 2007; Solhi et al., 2021; Tsai et al., 2020; Ulla Díez et al., 2012). Although this group lecture method helps increase knowledge, it is less effective in motivating the subject (Ozgonul & Alimoglu, 2017). As an alternative to compensate for these disadvantages, small group activities can enable the subjects to participate actively in education by increasing the opportunity to participate directly (Burgess, Diggele, Roberts, & Mellis, 2020). In this study, small group activities consisting of 4-6 students

not only provide information and understanding of knowledge by increasing the level of emotional support according to motivation or sense of homogeneity. Furthermore, telephone counseling in this study supported and shared the difficulties of using health care services and health problems and encouraged participants to increase physical activity, maintain the learned stress management technique in daily life, help the students actively participate in the program, and positively effect changes in health behavior.

Moreover, the CamHPP was delivered via different delivery methods, such as physical activity and stress management programs, and evaluated with objective measures. Most previous studies applied PA interventions and stress management through the educational program with the lecture method (Korn et al., 2017; Heeren et al., 2017; Min & Paek, 2007; Topp et al., 2011; Tsai et al., 2020; Ulla Díez et al., 2012). Few studies have been conducted on exercise programs. However, the evaluation of the effectiveness of interventions is only based on student self-report measures (Heeren et al., 2017; Park, 2011). In this study, the PA program intervention with badminton, walking with the Cashwalk app, and a healthy lifestyle diary were conducted. The enjoyment of using the Cashwalk app with monetary rewards contributes to having a more significant impact on exercise and directly affect the amount of activity (Kim, Shon, & Kim, 2020; Kim & Chung, 2020). Previous studies have revealed stress management technique practice to be an effective non-pharmacological intervention and exhibit a positive influence on anxiety, depression, and stress (Brown & Gerbarg, 2005; Dhawan, Chopra, Jain, & Yadav, 2015; Ma et al., 2017; Stromberg, Russell, & Carlson, 2015). In this study, a stress program combined educational programs with the practice of stress management techniques for Vietnamese students. In addition, the biochemical test was conducted to assess the impact of the health promotion program on body composition.

The CamHPP developed in this study is meaningful in that it identified

the health problems and barriers, reflected factors affecting health promotion behaviors, and identified students' health needs based on the PRECEDE-PROCEED model. It is a comprehensive health promotion program. The CamHPP combines health education, physical activity program with a pedometer app, stress relaxation methods, cultural adaptation, and information on how to use the healthcare system. Besides, the effectiveness of intervention health promotion was evaluated through objective measures with biochemical tests.

2. Evaluation of the health promotion program for Vietnamese students in Korea

This study was conducted as a randomized controlled trial to develop and evaluate the effectiveness of a CamHPP based on the PRECEDE-PROCEDE model for Vietnamese students residing in Korea. Following the 8-week health promotion program in the experimental group, Vietnamese students showed significant increases in health perception, social support, levels of perceived access to healthcare services and health promotion behavior; the perceived stress level was decreased, the level of biochemical indicators was improved, and the quality of life was increased.

As a result of this study, health perception showed a significant difference between pre and post-test, which was similar to the results of a previous study that applied a health promotion education program to college students (Erenoglu et al., 2019; Korn et al., 2017; Topp et al., 2011). The reason for the increase in the health perception of the experimental group was that through the health program, students received comprehensive information on the risk behavior, increased awareness of health issues, promoted

decision-making, and improved individuals' health. Besides, in previous studies, it is thought that health perception can be affected by other family members, and education was effective in this regard (Ebu, Amissah, Asiedu, Akaba, & Pereko, 2019). However, in this study, Vietnamese students study abroad away from their families, and the completion of health perception from family is limited. To improve health perception for student needs, education intervention. In previous studies on this topic, it was emphasized that education increased the perception of health, and students who perceive their health status positively can control their health status in the future and maintain their positive health behaviors (Almomani et al., 2021; Al- Natour et al., 2021; Erenoglu et al., 2019 Kara & Iscan, 2016; Kurtuncu, Uzun, & Ayoğlu, 2015). These results contribute to a clearer understanding of the role of educational intervention in improving health perception.

Besides the health perception, social support also showed a statistically significant difference between groups. The present study showed results similar to some other study results (Brett, 2020; Heeren et al., 2018; Tsai et al., 2020) after social support interventions bring positive effects and increased levels of perceived social support. In this study, peer support groups have been formed to aid (emotional, work-related, study, culture, health, and skill sharing) each other. It has contributed to increases interpersonal efficacy, enhanced coping skills, reduced loneliness, and raised perceptions of social support. In addition, the results of applying social support intervention in the study of Mattanah and Brooks (2010) showed social support as a useful strategy for behavioral adaptation in health promotion programs. Some studies show that support from friends and peers greatly improves peoples' chances of sticking with an exercise routine or dietary change (Bhochhibhoya et al., 2017). The buddying scheme and peer group as interventional therapy of social support in this program are considered to be effective. Compared to Chinese students, Vietnamese students have more difficulties adapting to university life. They often have limited

opportunities to connect with mainstream society and same-ethnic communities in the host country (An & Lee, 2017; Anh et al., 2021; Sun, 2018). To increase social support for Vietnamese students, we propose maintaining and enhancing group activities, an exercise buddy system, and social networks that encourage positive behavior changes, promote their academics, relieve their emotions, and increase healthy lifestyles.

In this study, after the CamHPP was implemented, Vietnamese students' levels of perceived access to healthcare services increased significantly in the experimental group. A limited number of previous studies only have focused on specific interventions for migrants and young adults (Britto, Klostermann, Bonny, Altum, & Hornung, 2001; Chiarenza, Dauvrin, Chiesa, Baatout, & Verrept, 2019; Mwanri et al., 2022). Therefore, a direct comparison of results is difficult. Access to healthcare services plays a crucial role and considers one of the main issues in setting health promotion for students (Masai, et al., 2021).

The study results showed that the mean score of health promotion lifestyle after the intervention had a significant increase in the experimental group compared to the beginning of the intervention. This finding is also consistent with the study results of previous studies, which found that health promotion interventions lead to increased lifestyle scores in the intervention group, improved attitudes toward health-related behaviors, and performing healthy behaviors (Brett, 2020; Erenoglu et al., 2019; McKinney, 2013; Min & Paek, 2007; Park, 2011; Solhi et al., 2020; Ulla Díez et al., 2012). The mean score of students in six subscales in the health promotion program after the intervention was significantly higher compared to before the intervention in the experimental group. Similar to the results of the present study, previous studies showed that through education intervention, students could improve self-efficacy and change beliefs, perceptions and affecting health behaviors (Estebsari et al., 2014; Solhi et al., 2020; Vrdoljak et al., 2014; Ulla Díez et al., 2012).

Besides, after the physical activity program was implemented, the experimental group showed an optimal level of biochemical indicators (TC, TG, HDL-C, LDL-C, serum cortisol) than the control group. Most previous studies have investigated the effects of health promotion programs on students, with results only based on self-report and objective measures were limited. Therefore, a direct comparison of study results is difficult. A study on young adults reported a decrease in TC, TG, LDL-C, and blood glucose after a 10-Day intensive health promotion program combining diet and PA (Lee, Lee, & Yeun, 2017). In this study, the health education program combined physical activity program (badminton, walking pedometer app, healthy lifestyle diary) was conducted for Vietnamese students. It can be said to be an effective intervention verified by objective measures analysis. Therefore, to achieve successful health promotion, it is important to help students recognize the importance of a healthy lifestyle by providing training on healthy eating habits and maintaining physical activity.

After the intervention was conducted with education on managing stress and four stress relaxation technique, the result showed a significant decrease in perceived stress levels and the serum cortisol level between pre and post-test. This result was similar to previous studies with an education program on stress conducted for college students (Tsai et al., 2020; Ulla Díez et al., 2012). Moreover, another previous study showed that education on stress and deep breathing method was influential on the level of depression decreased, reducing the negative impacts of stress (Anju et al., 2015; Brown & Gerbarg, 2005; Choi & Kim, 2015; Stromberg et al., 2015; Ulla Díez et al., 2012). Compared to students in Vietnam, Vietnamese students studying in Korea who are away from the management and control of their families live more independently in a new environment; they can't avoid stress during their education abroad. But they can make it a goal to keep everyday stress low. Therefore, to have a lifestyle that can be managed by oneself using appropriate coping methods for

the stress response experienced in daily life. The education managing stress and the stress relaxation technique in this program are considered effective for Vietnamese students.

Lastly, the quality of life was significantly different between the experimental and control groups. No studies have investigated the effects of health promotion programs on the quality of life of university students. However, a study to compare the quality of life of women-headed households with education program using the PRECEDE-PROCEED model exhibited that the quality of life scores of the experimental group was significantly higher than those of the control group (Solhi, Hamedan, & Salehi, 2016). In this study, through the health promotion program, the students were able to understand each other through sharing experiences about learning, adapting to a new life when away from home, sharing approaches to social support and health care services, and increasing intimacy between the students. It is thought that it may have helped improve Vietnamese students' quality of life. Furthermore, participants felt the health promotion program improved their physical function, maintained health promotion, and changed their lifestyle. Therefore, the health promotion program based on PRECEDE-PROCEED positively promotes the quality of life of international students.

The CamHPP was developed and implemented with a comprehensive approach to healthcare aspects and verified the program's effect by using biochemical indicators, which are the primary strength of this program. The health promotion program was implemented by utilizing the available resources in the university, policy proposals were deployed, and with cooperation and the active response of students, the program improved both psychosocial and biochemical indicators. In addition, in previous studies, interventions with various intervention periods significantly affected the outcome, but in this results study, even an 8-week program carried sufficient effects.

Based on the results of this study, in the aspect of nursing theory, the

PRECEDE-PROCEED model suggests a theoretical framework to guide health promotion strategies and improve the quality of life. This study provided an opportunity to empirically understand the PRECEDE-PROCEED model, contributed to increasing the usefulness of the nursing intervention model and laid the foundation for nurses to provide evidence-based practice through health promotion programs. Besides, in nursing research, this study is the first in Korea to develop a health promotion program targeting Vietnamese students. It is meant as a study that developed a health promotion program targeting a community group living in a new country, whereas most nursing studies have focused on patients with health problems. Additionally, CamHPP in this study based on the diagnosis process by applying the PRECEDE-PROCEED model. It has great significance in research methodology. Lastly, in nursing practice, this study developed and implemented a health promotion program for Vietnamese students studying in Korea based on the results of diagnosing various health-related factors. The results confirm the applicability of health promotion for international students and the evidence that the health of students living in the new country can be maintained and promoted through appropriate interventions. Health promotion is expected to be applied at the university for other international students. Continuing health promotion will maintain and improving international students' health and quality of life.

Although the results found in this study are satisfactory, it is important to keep in mind the limitations of this research. This study also had some limitations, including (1) only compared and analyzed the pre-test and post-test results and reported the program's effect. It should be checked through repeated measures after more than 6 months to see if the program's effectiveness continues. (2) The study subjects were selected as those intending to participate in the health promotion program. Therefore, the influence of an exogenous variable may exist. (3) Finally, the original questionnaires were developed in English, then translated into Vietnamese in this study. Although the

translation-back translation process was performed, and the reliability and validity of the Vietnamese version were tested, the possibility of misunderstanding items due to cultural differences may remain.

VI. Conclusion and suggestions

This study developed and applied a CamHPP for Vietnamese students in Korea. We used the PRECEDE-PROCEED Model as a framework to design health promotion interventions to improve quality of life by enhancing support and improving health promotion behavior for Vietnamese students. In order to evaluate the effect of the health promotion program, a randomized controlled trial with control group design was conducted. A health promotion program was provided once a week for eight weeks, with 27 students in the experimental group and 28 in the control group. After eight weeks of intervention, the CamHPP was verified as an effective intervention to improve health perception, social support, health care services access, health promotion behavior, biochemical indicators, perceived stress, and the quality of life of Vietnamese students.

Based on the assessment process applying the PRECEDE-PROCEED model, health problems, barriers, health needs and the current status of the students were identified. Then a CamHPP was developed with a systematic approach. While most of the previous studies were limited to the application of PRECEDE, the program's effect was analyzed based on the PRECEDE-PROCEED model's evaluation process in this study. This research not only improved health promotion but also culture adaptation as an important determinant of health and well-being for Vietnamese students.

Based on the results of this study, the following are suggestions.

First, this study verified the program’s effectiveness of eight weeks CamHPP. It is suggested that a long-term follow-up study of more than 6 months.

Second, developing a culturally sensitive program is essential, which helps nurses and health workers to understand better the unique needs of

international students or foreigners and to break down barriers that get in the way of their receiving the care they need.

Third, in order to acculturate and improve health promotion behavior for international students, we suggest CamHPP as the supplement to educational material and analysis of the needs of international students. University policies would need to be developed to promote health of international students.

Fourth, further studies are needed to verify the effectiveness of a health promotion program based on the PRECEDE-PROCEED model to other international students.

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< Appendix 1> Participant informed consent form

Explanation of research topic and consent form for participants
(All participants)

Research: Development and evaluation of a campus-based health promotion program (CamHPP) for Vietnamese students in Korea: A randomized controlled trial

You should read the instructions and consent form carefully before deciding whether or not to participate in this study. You must understand why this study was conducted. Principal investigator Tran Thi Quynh Anh, who conducted this study, will explain the study to you. This study will only be conducted on people who have voluntarily expressed their intention to participate. Please read the following carefully before deciding to participate, and if necessary, discuss it with your family and friends. If you have any questions, the researcher will explain in detail. Your signature means that you have read, understood, and agreed to participate.

1. Background and purpose of the study

Vietnamese students in Korea face various challenges while studying in an unfamiliar environment; these factors affect their health and quality of life. Besides, they have difficulty taking health-promoting lifestyle actions because they live far away from home and in a new environment. This study aimed to develop and determine the effect of the campus-based health promotion program targeting Vietnamese students in Korea.

2. Participants

This study will conduct on 56 Vietnamese students (including language students, undergraduate, and graduate students) who have been studying at K

University of Korea for more than six months. However, exchange students will exclude from this study.

3. Procedure to participate in the study

If you indicate your intention to participate, the following process will occur. We invite you to participate in this study by being randomly assigned to one of two experimental or control groups using 1:1 randomization.

4. Time to participate in the study

Fill out a survey and take the blood test

1) The survey

We will give information on which group you will allocate. We will ask you to complete the survey two times, which every time should take approximately 30-40 minutes. This survey with a self-report questionnaire includes demographic characteristics, health perceptions, social support, health promotion behavior, perceived stress, and quality of life when studying in Korea.

However, if you are an experimental group, you will be asked to participate more than once a week for seven weeks health promotion program. The health promotion program will deliver 45-60 minutes of physical, mental, social, and nutrition education to promote health once a week using weekend time. Specifically, health promotion activities (health responsibility, proper nutrition, physical activity), stress management, interpersonal relationships, mental development, accessibility to healthcare services, cultural adaption and social support will be conducted2) Blood test

2) A blood test conducted through Nursing Science Research Institute

In this study, blood tests will conduct two times through the Nursing Science Research Institute - at Keimyung University. After alcohol disinfection in the arm's vein (usually near the elbow), blood will collect (about 6cc) after

the needle is pierce.

- The first screening begins on the date of consent for the study. Complete blood count (hemoglobin Hb, hematocrit Hct, red blood cells RBC, white blood cells WBC), lipid profiles (total cholesterol, triglyceride, high-density lipoprotein cholesterol and low-density lipoprotein cholesterol), and serum cortisol will be basic items.

- The second checkup will conduct at the Nursing Science Research Institute - at Keimyung University. Seven weeks after completing the first checkup, according to a separate guide (phone, text, or e-mail contact). For your reference, if you would like to receive the results of the basic examination through blood, we can deliver the results by mail or e-mail. As with the first time, you will call and schedule a visit.

Please note that the second screening will conduct for all study subjects, just like the first screening.

5. Stop participating in the study

You can stop participating in the study at any time, even if you have already participated. If you wish to discontinue participation in the study, please notify the researcher immediately.

6. Side effects or risk factors

Side effects or risks and discomfort with blood collection

Blood collection will be conducted at Keimyung University's Nursing Science Research Institute. This method is not different from the usual blood test method. When taking a blood sample, you may feel some discomfort in your arm for a short time due to the needle, and in some cases, bruising, bleeding, and infection may occur very rarely when drawing blood.

If side effects such as infection occur while participating in the study, we will do our best to provide free treatment.

7. Benefits of participating in research

This study aims to determine whether there is a change in blood index for 8 weeks in the experimental and the control groups. There is no compensation for participating in this study. However, you can receive blood test results.

Furthermore, based on the results, you can use customized health-related content (health information, exercise guide, nutrition) and health management for seven weeks.

The research will allow participants to share their thoughts and experiences about health promotion behavior. They will learn even more about their condition than they knew before. They may have the opportunity to take on new approaches to maintaining and promoting optimal health, to choose healthy behaviors, and make changes that reduce the risk of developing diseases. Each time you participate in this study, 10,000 won per person will provide individuals with light food and refreshments in pre-packaged boxes with takeout.

8. Penalties for not participating in the study

You are free to opt-out of this study. In addition, you will not be disadvantaged if you do not participate in this study. Also, you may withdraw from participating in the study at any time during the study. Please inform the Principal Investigator immediately if you wish to stop participating in the study. In case of discontinuation of participation, your data will no longer be used for research and will be immediately destroyed by permanent deletion of the computer database and permanent shredding of documents. Collected human material will also no longer be used for research and will be disposed of immediately.

9. Storage and disposal of human derivatives

Blood collected from you is refrigerated.

After the retention period, the test blood products are immediately disposed of according to the standards and methods in accordance with Article 13 of the Waste Management Act. In addition, if you request a change or disposal of the retention period while the test object is being preserved, Article 39 of the Bioethics and Safety Act Changes will be disposed of upon request in accordance with paragraphs 1 and 2.

The provision and disposal of test blood products will be recorded and managed by the person in charge of the testing institution and by the Human Derivatives Management Directorate.

Even after consenting to participate in the study, the study subject may withdraw from this participation at any time. In the case of withdrawal of consent for research, if the test has not yet been performed, it will be immediately disposed of, and even if consent is withdrawn after the test is completed, the sample test result will be destroyed immediately. In the event that the research cannot be continued due to a significant interruption in the progress of the research, in principle, the collected human material is immediately disposed of, and your test object will be managed under the supervision of the responsible researcher. The management number is managed thoroughly separately from personally identifiable information, and only the responsible researcher (or delegated researcher) records and manages the personal identifier.

10. Privacy and security

The personal information collected from you through your participation in this study is as follows. Your general characteristics, health perception, social support, health-promoting behaviors, and quality of life were used for the 6-month study. According to the Ethics personal information protection law, the

information collected was managed appropriately. Relevant information is stored in a lockable drawer and can only be accessed by the Principal Investigator. We will make every effort to ensure the confidentiality of all personal information obtained through research. Your name and other personal information will not be used when personal information obtained from this research is disclosed in a scientific journal or conference. However, if required by law, your personal information may be provided. In addition, public institution bioethics officers, supervisors, and committees can directly view study results to verify the reliability of this study's procedures and data within the scope of this study. The scope is covered by relevant regulations without infringing on the confidentiality of the research subject. By signing this consent form, you will be deemed to know and agree to these matters. Upon completion of the study, the data related to the study will be kept for three years and then destroyed (software data will be destroyed via the unrecoverable file deletion method, and paper data will be destroyed through the shredder).

11. Contents related to the withdrawal of consent

You can withdraw your consent and not participate in the study at any time, even if you have agreed to participate in the study.

12. Ask questions about the research

If you have any questions about this study or any problems during the study, please contact the following: Tran Thi Quynh Anh, Tel: 010.2083.3949, Email: quynhanhcdyttg@gmail.com

If you have any questions about your rights as a research subject, please contact: Keimyung University-Institutional Review Board at 053-580-6299 or E-mail: kmirb@kmu.ac.kr

Researcher: Tran Thi Quynh Anh	(Signature)	Date:
Research participants name:	(Signature)	Date:

Explanation of research topic and consent form for participants

(Control group)

Research: Development and evaluation of a campus-based health promotion program (CamHPP) for Vietnamese students in Korea: A randomized controlled trial

You should read the instructions and consent form carefully before deciding whether or not to participate in this study. You must understand why this study was conducted. Principal investigator Tran Thi Quynh Anh, who conducted this study, will explain the study to you. This study will only be conducted on people who have voluntarily expressed their intention to participate. Please read the following carefully before deciding to participate, and if necessary, discuss it with your family and friends. If you have any questions, the researcher will explain in detail. Your signature means that you have read, understood, and agreed to participate.

1. Background and purpose of the study

Vietnamese students in Korea face various challenges while studying in an unfamiliar environment; these factors affect their health and quality of life. Besides, they have difficulty taking health-promoting lifestyle actions because they live far away from home and in a new environment. This study aimed to develop and determine the effect of the campus-based health promotion program targeting Vietnamese students in Korea.

2. Participants

This study will conduct on 28 Vietnamese students (including language students, undergraduate, and graduate students) who have been studying at K University of Korea for more than 6 months. However, exchange students will exclude from this study.

3. Procedure to participate in the study

If you indicate your intention to participate, the following process will take place.

1) The survey

We will give information on which group you will allocate. We will ask you to complete the survey two times, which every time should take approximately 30-40 minutes. This survey with a self-report questionnaire, including demographic characteristics, health perceptions, social support, health promotion behavior, perceived stress, and quality of life when you are studying in Korea.

2) A blood test conducted through Nursing Science Research Institute

In this study, blood tests will conduct two times through the Nursing Science Research Institute - at Keimyung University. In general, after alcohol disinfection in the arm's vein (usually near the elbow), blood is collected (about 6cc) after the needle is pierced.

- The first screening begins on the date of consent for the study. Complete blood count (hemoglobin Hb, hematocrit Hct, red blood cells RBC, white blood cells WBC), lipid profiles (total cholesterol, triglyceride, high-density lipoprotein cholesterol, and low density lipoprotein cholesterol), and serum cortisol will be basic items.

- The second checkup will conduct at the Nursing Science Research Institute - at Keimyung University. Seven weeks after completing the first checkup, according to a separate guide (phone, text, or e-mail contact). For your reference, if you would like to receive the results of the basic examination through blood, we can deliver the results by mail or e-mail. As with the first time, you will call and schedule a visit.

Please note that the second screening will conduct for all study subjects, just like the first screening.

4. Time to participate in the study

You will be asked to participate a total of 2 times for this study (Fill out the first survey and blood test and complete the second 7 weeks later). Each survey and blood test will take a total of 45-50 minutes.

5. Stop participating in the study

You can stop participating in the study at any time, even if you have already participated in the study. If you wish to discontinue participation in the study, please notify the researcher immediately.

6. Side effects or risk factors

Side effects or risks and discomfort with blood collection

Blood collection will conduct at Keimyung University's Nursing Science Research Institute. This method is not different from the usual blood test method. When taking a blood sample, you may feel some discomfort in your arm for a short time due to the needle, and in some cases, bruising, bleeding, and infection may occur very rarely when drawing blood.

If side effects such as infection occur while participating in the study, we will do our best to provide free treatment.

7. Benefits of participating in research

This study aims to determine whether there is a change in blood index for 7 weeks in the experimental and the control groups.

There is no compensation for participating in this study. However, You can receive blood test results.

Furthermore, based on the results, you can use customized health-related content (health information, exercise guide and nutrition) and health management for seven weeks.

The research will allow participants to share their thoughts and experiences about health promotion behavior. They will learn even more about their condition than they knew before. They may have the opportunity to take on new approaches to maintaining and promoting optimal health, to choose healthy behaviors, and make changes that reduce the risk of developing diseases. Each time you participate in this study, 10,000 won per person will provide individuals with light food and refreshments in pre-packaged boxes with takeout.

8. Penalties for not participating in the study

You are free to opt-out of this study. In addition, you will not be disadvantaged if you do not participate in this study. Also, you may withdraw from participating in the study at any time during the course of the study. Please inform the Principal Investigator immediately if you wish to stop participating in the study. In case of discontinuation of participation, your data will no longer be used for research and will be immediately destroyed by permanent deletion of the computer database and permanent shredding of documents. Collected human material will also no longer be used for research and will be disposed of immediately.

9. Storage and disposal of human derivatives

Blood collected from you is refrigerated.

After the retention period, the test blood products are immediately disposed of according to the standards and methods in accordance with Article 13 of the Waste Management Act. In addition, if you request a change or disposal of the retention period while the test object is being preserved, Article 39 of the Bioethics and Safety Act Changes will be disposed of upon request in accordance with paragraphs 1 and 2.

The provision and disposal of test blood products will be recorded and

managed by the person in charge of the testing institution and by the Human Derivatives Management Directorate.

Even after consenting to participate in the study, the study subject may withdraw from this participation at any time. In the case of withdrawal of consent for research, if the test has not yet been performed, it will be immediately disposed of, and even if consent is withdrawn after the test is completed, the sample test result will be destroyed immediately. In the event that the research cannot be continued due to a significant interruption in the progress of the study, in principle, the collected human material is immediately disposed of, and your test object will be managed under the supervision of the responsible researcher. The management number is managed thoroughly separately from personally identifiable information, and only the responsible researcher (or delegated researcher) records and manages the personal identifier.

10. Privacy and security

The personal information collected from you through your participation in this study is as follows. Your general characteristics, health perception, social support, health-promoting behaviors, and quality of life were used for the 6-month study. According to the Ethics personal information protection law, the information collected was managed appropriately. Relevant information is stored in a lockable drawer and can only be accessed by the Principal Investigator. We will make every effort to ensure the confidentiality of all personal information obtained through research. Your name and other personal information will not be used when personal information obtained from this research is disclosed in a scientific journal or conference. However, if required by law, your personal information may be provided. In addition, public institution bioethics officers, supervisors, and committees can directly view study results to verify the reliability of this study's procedures and data within the scope of this study. The scope is covered by relevant regulations without

infringing on the confidentiality of the research subject. By signing this consent form, you will be deemed to know and agree to these matters. Upon completion of the study, the data related to the study will be kept for 3 years and then destroyed (software data will be destroyed via the unrecoverable file deletion method, and paper data will be destroyed through the shredder).

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You can withdraw your consent and not participate in the study at any time, even if you have agreed to participate.

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If you have any questions about this study or any problems during the study, please contact the following: Tran Thi Quynh Anh, Tel: 010.2083.3949, Email: quynhanhcdyttg@gmail.com

If you have any questions about your rights as a research subject, please contact: Keimyung University-Institutional Review Board at 053-580-6299 or E-mail: kmirb@kmu.ac.kr

Researcher: Tran Thi Quynh Anh (Signature) Date:

Research participants name: (Signature) Date:

Explanation of research topic and consent form for participants

(Experimental group)

Research: Development and evaluation of a campus-based health promotion program (CamHPP) for Vietnamese students in Korea: A randomized controlled trial

You should read the instructions and consent form carefully before deciding whether or not to participate in this study. You must understand why this study was conducted. Principal investigator Tran Thi Quynh Anh, who conducted this study, will explain the study to you. This study will only be conducted on people who have voluntarily expressed their intention to participate. Please read the following carefully before deciding to participate, and if necessary, discuss it with your family and friends. If you have any questions, the researcher will explain in detail. Your signature means that you have read, understood, and agreed to participate.

1 . Background and purpose of the study

Vietnamese students in Korea face various challenges while studying in an unfamiliar environment; these factors affect their health and quality of life. Besides, they have difficulty taking health-promoting lifestyle actions because they live far away from home and in a new environment. This study aimed to develop and determine the effect of the campus-based health promotion program targeting Vietnamese students in Korea.

2. Participants

This study will conduct on 28 Vietnamese students (including language students, undergraduate, and graduate students) who have been studying at K University of Korea for more than 6 months. However, exchange students will

exclude from this study.

3. Procedure to participate in the study

If you indicate your intention to participate, the following process will take place.

You will be asked to participate once a week for 8 weeks in this study (fill out a questionnaire, take the blood test and participate in a health program).

1) The survey

We will give information on which group you will allocate. We will ask you to complete the survey two times, which every time should take approximately 30-40 minutes. This survey with a self-report questionnaire includes demographic characteristics, health perceptions, social support, health promotion behavior, perceived stress, and quality of life when studying in Korea.

However, if you are an experimental group, you will be asked to participate more than once a week for seven weeks health promotion program. The health promotion program will deliver 45-60 minutes of physical, mental, social, and nutrition education to promote health once a week using weekend time. Specifically, health promotion activities (health responsibility, proper nutrition, physical activity), stress management, interpersonal relationships, mental development, accessibility to healthcare services, cultural adaption and social support will be conducted

2) Blood test

A blood test conducted through Nursing Science Research Institute

In this study, blood tests will conduct two times through the Nursing Science Research Institute - at Keimyung University. In general, after alcohol disinfection in the arm's vein (usually near the elbow), blood is collected (about 6cc) after the needle is pierced.

- The first screening begins on the date of consent for the study. Complete blood count (hemoglobin Hb, hematocrit Hct, red blood cells RBC, white blood cells WBC), lipid profiles (total cholesterol, triglyceride, high-density lipoprotein cholesterol and low-density lipoprotein cholesterol), and serum cortisol will be basic items.

- The second checkup will conduct at the Nursing Science Research Institute - at Keimyung University. Seven weeks after completing the first checkup, according to a separate guide (phone, text, or e-mail contact). For your reference, if you would like to receive the results of the basic examination through blood, we can deliver the results by mail or e-mail. As with the first time, you will call and schedule a visit.

Please note that the second screening will conduct for all study subjects, just like the first screening.

3) Health promotion program: 8 weeks health promotion education program.

The Health Promotion Program will deliver 45-60 minutes of physical, mental, social and nutrition education to promote health once a week using weekend time. Specifically, health promotion activities (health responsibility, proper nutrition, physical activity), stress management, interpersonal relationships, mental development, accessibility to healthcare service, cultural adaption and social support will conduct.

4. Time to participate in the study

You will be asked to participate once a week for 8 weeks for this study. The health promotion program is expected to be 45-60 minutes once a week (weeks 1-7). Each survey and blood test is scheduled to last approximately 45-50 minutes (weeks 1 and 8).

5. Stop participating in the study

You can stop participating in the study at any time, even if you have

already participated in the study. If you wish to discontinue participation in the study, please notify the researcher immediately.

6. Side effects or risk factors

Side effects or risks and discomfort with blood collection

Blood collection will be conducted at Keimyung University's Nursing Science Research Institute. This method is not different from the usual blood test method. When taking a blood sample, you may feel some discomfort in your arm for a short time due to the needle, and in some cases, bruising, bleeding, and infection may occur very rarely when drawing blood.

If side effects such as infection occur while participating in the study, we will do our best to provide free treatment.

7. Benefits of participating in research

The purpose of this study is to determine whether there is a change in blood index for seven weeks in the experimental group and the control group. There is no compensation for participating in this study. However, you can receive blood test results. Furthermore, based on the results, you can use customized health-related content (health information, exercise guide, nutrition) and health management for seven weeks.

The research will give participant's a chance to share their thoughts and experiences about health promotion behavior. They will learn even more about their condition than they knew before. They may have the opportunity to take on new approaches to maintaining and promoting optimal health, to choose healthy behaviors, and make changes that reduce the risk of developing diseases. Each time you participate in this study, 10,000 won per person will provide individuals with light food and refreshments in pre-packaged boxes with takeout.

8. Penalties for not participating in the study

You are free to opt-out of this study. In addition, there will be no disadvantage to you if you do not participate in this study. Also, you may withdraw from participating in the study at any time during the course of the study. If you wish to stop participating in the study, please inform the Principal Investigator immediately. In case of discontinuation of participation, your data will no longer be used for research and will be immediately destroyed by permanent deletion of the computer database and permanent shredding of documents. Collected human material will also no longer be used for research and will be disposed of immediately.

9. Storage and disposal of human derivatives

Blood collected from you is refrigerated.

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The provision and disposal of test blood products will be recorded and managed by the person in charge of the testing institution and by the Human Derivatives Management Directorate.

Even after consenting to participate in the study, the study subject may withdraw from this participation at any time. In the case of withdrawal of consent for research, if the test has not yet been performed, it will be immediately disposed of, and even if consent is withdrawn after the test is completed, the sample test result will be destroyed immediately. In the event that the research cannot be continued due to a significant interruption in the progress of the research, in principle, the collected human material is

immediately disposed of, and your test object will be managed under the supervision of the responsible researcher. The management number is managed thoroughly separately from personally identifiable information, and only the responsible researcher (or delegated researcher) records and manages the personal identifier.

10. Privacy and security

The personal information collected from you through your participation in this study is as follows. Your general characteristics, health perception, social support, health-promoting behaviors, and quality of life were used for the 6-month study. According to the Ethics personal information protection law, the information collected was managed appropriately. Relevant information is stored in a lockable drawer and can only be accessed by the Principal Investigator. We will make every effort to ensure the confidentiality of all personal information obtained through research. Your name and other personal information will not be used when personal information obtained from this research is disclosed in a scientific journal or conference. However, if required by law, your personal information may be provided. In addition, public institution bioethics officers, supervisors, and committees can directly view study results to verify the reliability of this study's procedures and data within the scope of this study. The scope is covered by relevant regulations without infringing on the confidentiality of the research subject. By signing this consent form, you will be deemed to know and agree to these matters. Upon completion of the study, the data related to the study will be kept for three years and then destroyed (software data will be destroyed via the unrecoverable file deletion method, paper data will be destroyed through the shredder).

11. Contents related to the withdrawal of consent

You can withdraw your consent and not participate in the study at any

time even if you have agreed to participate in the study.

12. Ask questions about the research

If you have any questions about this study or any problems during the study, please contact the following: Tran Thi Quynh Anh, Tel: 010.2083.3949, Email: quynhanhcdyttg@gmail.com

If you have any questions about your rights as a research subject, please contact: Keimyung University-Institutional Review Board at 053-580-6299 or E-mail: kmirb@kmu.ac.kr

Researcher: Tran Thi Quynh Anh	(Signature)	Date:
Research participants name:	(Signature)	Date:

<Appendix 2> Questionnaires

1. The following are general matters. Please read each item carefully and mark (√) on the corresponding position.

1/ What is your gender? 1. Male 2. Female

2/ How old are you? *Please write year* you were born_____, "___ *years old*"

3/ Do you have a housemate?

1. Yes 2. No

4/ What is your educational background?

1. Korean course
2. Undergraduate
3. Master
4. Doctoral

5/ Your Korean proficiency (TOPIK):

1. Level 1
2. Level 2
3. Level 3
4. Level 4
5. Level 5
6. Level 6
7. Unknown

6/ What is your housing type in Korea?

1. Dormitory
2. Studio
3. Living with family
4. Living with friends
5. Other _____

7/ Length of stay in Korea? ___ year ___ month

8/ Source of your living expenses

1. Scholarship
2. Research grant
3. Parent support
4. Part-time job

2. The following questions are about your health perceptions. After reading each question, please check (√) the box that best matches your current opinion.

Score of the each item:

1=Definitely false; 2=Mostly false; 3=Don't know; 4= Mostly true;

5= Definitely true

	Rating				
1. According to the doctors I've seen, my health is now excellent	1	2	3	4	5
2. I try to avoid letting illness interfere with my life	1	2	3	4	5
3. I seem to get sick a little easier than other people	1	2	3	4	5
4. I feel better now than I ever have before	1	2	3	4	5
5. I will probably be sick a lot in the future	1	2	3	4	5
6. I never worry about my health	1	2	3	4	5
7. Most people get sick a little easier than I do	1	2	3	4	5
8. I don't like to go to the doctor	1	2	3	4	5
9. I am somewhat ill	1	2	3	4	5
10. In the future, I expect to have better health than other people I know	1	2	3	4	5
11. I was so sick once I thought I might die	1	2	3	4	5
12. I'm not as healthy now as used to be	1	2	3	4	5
13. I worry about my health more than other people worry about their health	1	2	3	4	5
14. When I'm sick, I try to just keep going as usual	1	2	3	4	5
15. My body seems to resist illness very well	1	2	3	4	5
16. Getting sick once in a while is a part of my life	1	2	3	4	5

	Rating				
17. I'm as healthy as anybody I know	1	2	3	4	5
18. I think my health will be worse in the future than it is now	1	2	3	4	5
19. I've never had an illness that lasted a long period of time	1	2	3	4	5
20. Others seem more concerned about their health than I am about mine	1	2	3	4	5
21. When I'm sick, I try to keep it to myself	1	2	3	4	5
22. My health is excellent	1	2	3	4	5
23. I expect to have a very healthy life	1	2	3	4	5
24. My health is a concern in my life	1	2	3	4	5
25. I accept that sometimes I'm just going to be sick	1	2	3	4	5
26. I have been feeling bad lately	1	2	3	4	5
27. It doesn't bother me to go to a doctor	1	2	3	4	5
28. I have never been seriously ill	1	2	3	4	5
29. When there is something going around, I usually catch it	1	2	3	4	5
30. Doctors say that I am now in poor health	1	2	3	4	5
31. When I think I am getting sick, I fight it	1	2	3	4	5
32. I feel about as good now as I ever have	1	2	3	4	5

3. The following questions relate to the social support you have experienced from those around you. Please check (√) the box that most closely matches your current opinion.

Score of the each item:

1=Definitely false; 2=Probably false; 3=Probably true; 4= Definitely true

	Rating			
1. I have someone I can turn to for help when I need to do something	1	2	3	4
2. There are very few people around me who want to work with me	1	2	3	4
3. I have someone to take me to the hospital when I am sick	1	2	3	4
4. I have someone who can tell me what is wrong with what I do	1	2	3	4
5. I don't get along well with my friends	1	2	3	4
6. I have no one to help me with my daily life when sick	1	2	3	4
7. I have someone to talk to on the phone when I am lonely and depressed	1	2	3	4
8. I don't have anyone to give me an objective opinion about how I do my work	1	2	3	4
9. Most of my friends are more pleasant and fun than me	1	2	3	4
10. I am satisfied with my life compared to others	1	2	3	4
11. I do not have a reliable economic advisor	1	2	3	4
12. Most of my friends change their lives more successfully than me	1	2	3	4
13. I regularly meet with family and friends and have fun	1	2	3	4
14. When I go out for a long time, I have someone to help me and look after the house	1	2	3	4

	Rating			
15. I am not good at following the steps of my friends	1	2	3	4
16. If I need to post mail before the post office closes, I have someone to do it for me.	1	2	3	4

4. The following questions are about your perceived access to health care scale. After reading each question, please check (√) the box that best matches your current opinion.

Score of the each item:

1=Absolutely disagree; 2=Disagree; 3=Neutral; 4=Agree; 5=Absolutely agree

	Rating				
1. The services I need are provided at the health center	1	2	3	4	5
2. The distance from the health centers to my house is appropriate	1	2	3	4	5
3. The time required to reach the health center is appropriate	1	2	3	4	5
4. Getting to and from the health center is easy for me	1	2	3	4	5
5. Access health center at university is easy for me	1	2	3	4	5
6. The health services (immunization, medical visit, injections, etc.). I need to be provided at the public health center	1	2	3	4	5
7. The facilities of the health center meet the health needs of the clients	1	2	3	4	5
8. The quality of services provided in the health center is acceptable	1	2	3	4	5
9. The health center staff meets the needs of the clients in various ways, such as being introduced to community resources and translators	1	2	3	4	5
10. Health workers listen carefully to what I have to say	1	2	3	4	5

	Rating				
11. The health workers give me enough time	1	2	3	4	5
12. Health workers ensure I fully understand the health information provided	1	2	3	4	5
13. I trust the statements of the treatment team (doctor, nurse, midwife, etc.) about my health and illness	1	2	3	4	5
14. The treatment team at the health center is respectful	1	2	3	4	5
15. The cost when using health care services is appropriate	1	2	3	4	5
16. Communicates easily when seeking and using health services	1	2	3	4	5
17. It is easy to make an appointment at a health center	1	2	3	4	5
18. I can discuss health issues and changes in my condition over the phone (in person) with the treatment team (doctor, nurse, midwife, etc.).	1	2	3	4	5
19. The information I need is expressed in simple language without the use of specialized words.	1	2	3	4	5
20. Communication of health workers (doctor, nurse, midwife, etc.) with clients is appropriate.	1	2	3	4	5
21. My living conditions are taken into accounts, such as the ability to pay and cultural differences.	1	2	3	4	5
22. I understand health services and the health care system when living in Korea	1	2	3	4	5

5. The following questions are about your perceived stress scale. After reading each question, please check (√) the box that best matches your opinion.

Score of the each item:

0=Never; 1=Almost never; 2=Sometimes; 3=Fairly often; 4= Very often

	Rating				
1. According to the doctors I've seen, my health is now excellent	0	1	2	3	4
2. I try to avoid letting illness interfere with my life	0	1	2	3	4
3. I seem to get sick a little easier than other people	0	1	2	3	4
4. I feel better now than I ever have before	0	1	2	3	4
5. I will probably be sick a lot in the future	0	1	2	3	4
6. I never worry about my health	0	1	2	3	4
7. Most people get sick a little easier than I do	0	1	2	3	4
8. I don't like to go to the doctor	0	1	2	3	4
9. I am somewhat ill	0	1	2	3	4
10. In the future, I expect to have better health than other people I know	0	1	2	3	4

6. It is about your current lifestyle or habits. Please check (√) the degree to which you follow each behavior pattern from the following items. Please answer each question as accurately as possible and thank you for not skipping any questions.

Score of the each item:

1=Never; 2=Sometimes; 3=Often; 4= Routinely

	Rating			
1. Discuss my problems and concerns with people close to me.	1	2	3	4
2. Choose a diet low in fat, saturate fat, and cholesterol.	1	2	3	4
3. Report any unusual signs or symptoms to a physician or other health professional.	1	2	3	4
4. Follow a planned exercise program.	1	2	3	4
5. Get enough sleep.	1	2	3	4
6. Feel I am growing and changing in positive ways.	1	2	3	4
7. Praise other people easily for their achievements.	1	2	3	4
8. Limit use of sugars and food containing sugar (sweets).	1	2	3	4
9. Read or watch TV programs about improving health.	1	2	3	4
10. Exercise vigorously for 20 or more minutes at least three times a week (such as brisk walking, bicycling, aerobic dancing, using a stair climber).	1	2	3	4
11. Take some time for relaxation each day.	1	2	3	4
12. Believe that my life has purpose.	1	2	3	4
13. Maintain meaningful and fulfilling relationships with others.	1	2	3	4
14. Eat 6-11 servings of bread, cereal, rice and pasta each day.	1	2	3	4
15. Question health professionals in order to understand their instructions.	1	2	3	4

	Rating			
16. Take part in light to moderate physical activity (such as sustained walking 30-40 minutes 5 or more times a week).	1	2	3	4
17. Accept those things in my life which I cannot change.	1	2	3	4
18. Look forward to the future.	1	2	3	4
19. Spend time with close friends.	1	2	3	4
20. Eat 2-4 servings of fruit each day.	1	2	3	4
21. Get a second opinion when I question my health care provider's advice.	1	2	3	4
22. Take part in leisure-time (recreational) physical activities (such as swimming, dancing, and bicycling).	1	2	3	4
23. Concentrate on pleasant thoughts at bedtime.	1	2	3	4
24. Feel content and at peace with myself.	1	2	3	4
25. Find it easy to show concern, love and warmth to others.	1	2	3	4
26. Eat 3-5 servings of vegetables each day.	1	2	3	4
27. Discuss my health concerns with health professionals.	1	2	3	4
28. Do stretching exercises at least three times per week.	1	2	3	4
29. Use specific methods to control my stress.	1	2	3	4
30. Work toward long-term goals in my life.	1	2	3	4
31. Touch and am touched by people I care about.	1	2	3	4
32. Eat 2-3 servings of milk, yogurt, or cheese each day.	1	2	3	4
33. Inspect my body at least monthly for physical changes/danger signs.	1	2	3	4

	Rating			
34. Get exercise during usual daily activities (such as walking during lunch, using stairs instead of elevators, parting car away from the destination, and walking	1	2	3	4
35. Balance time between work and play.	1	2	3	4
36. Find each day interesting and challenging.	1	2	3	4
37. Find ways to meet my needs for intimacy.	1	2	3	4
38. Eat only 2-3 servings from the meat, poultry, fish, dried beans, eggs, and nuts group each day.	1	2	3	4
39. Ask for information from health professionals about how to take good care of myself.	1	2	3	4
40. Check my pulse rate when exercising.	1	2	3	4
41. Practice relaxation or meditation for 15-20 minutes daily.	1	2	3	4
42. I am aware of what is important to me in life.	1	2	3	4
43. Get support from a network of caring people.	1	2	3	4
44. Read labels to identify nutrients, fats, and sodium content in packaged food.	1	2	3	4
45. Attend educational programs on personal health care.	1	2	3	4
46. Reach my target heart rate when exercising.	1	2	3	4
47. Pace myself to prevent tiredness.	1	2	3	4
48. Feel connected with some force greater than myself.	1	2	3	4
49. Settle conflicts with others through discussion and compromise.	1	2	3	4
50. Eat breakfast.	1	2	3	4
51. Seek guidance or counseling when necessary.	1	2	3	4
52. Expose myself to new experiences and challenges.	1	2	3	4

7. The following questions are about your quality of life. Please check (√) the box that most closely matches your current opinion.

	Very poor	Poor	Neither poor nor good	Good	Very good
1. How would you rate your quality of life	1	2	3	4	5
2. How satisfied are you with your health?	1	2	3	4	5
The following questions ask about how much you have experienced certain things in the last two weeks					
	Not at all	A little	A moderate amount	Very much	An extreme amount
3. To what extent do you feel that physical pain prevents you from doing what you need to do?	1	2	3	4	5
4. How much do you need any medical treatment to function in your daily life?	1	2	3	4	5
5. How much do you enjoy life?	1	2	3	4	5
6. To what extent do you feel your life to be meaningful?	1	2	3	4	5
7. How well are you able to concentrate?	1	2	3	4	5
8. How safe do you feel in your daily life?	1	2	3	4	5
9. How healthy is your physical environment?	1	2	3	4	5
10. Do you have enough energy for everyday life?	1	2	3	4	5
11. Are you able to accept your bodily appearance?	1	2	3	4	5
12. Have you enough money to meet your needs?	1	2	3	4	5
13. How available to you is the information that you need in your day-to-day life?	1	2	3	4	5
14. To what extent do you have the opportunity for leisure activities?	1	2	3	4	5
15. How well are you able to get around?	1	2	3	4	5
The following questions ask you to say how good or satisfied you have felt about various aspects of your life over the last two weeks.					

	Very dissati-sfied	Dissat-isfied	Neither satisfied nor dissatisf-ied	Satis-fied	Very satisfi-ed
16. How satisfied are you with your sleep?	1	2	3	4	5
17. How satisfied are you with your ability to perform your daily living activities?	1	2	3	4	5
18. How satisfied are you with your capacity for work?	1	2	3	4	5
19. How satisfied are you with yourself?	1	2	3	4	5
20. How satisfied are you with your personal relationships?	1	2	3	4	5
21. How satisfied are you with your sex life?	1	2	3	4	5
22. How satisfied are you with the support you get from your friends?	1	2	3	4	5
23. How satisfied are you with the conditions of your living place?	1	2	3	4	5
24. How satisfied are you with your access to health services?	1	2	3	4	5
25. How satisfied are you with your transport?	1	2	3	4	5
The following question refers to how often you have felt or experienced certain things in the last two weeks.					
	Never	Seldom	Quite often	Very often	Always
26. How often do you have negative feelings such as blue mood, despair, anxiety, and depression?	1	2	3	4	5

<Appendix 3> Campus-based health promotion program (CamHPP) contents

Weeks	Topic	Delivery setting	Contents/ duration (min)		
1	Getting started and ready for CamHPP	Group	Target	• Understand the purpose and process of the health promotion program. • Get ready for health promotion • Pre-test	
			Contents & methods	<Orientation> • Researcher introduction, research purpose, and importance of the study. Program schedule and content description • Participants greet and share individual will with participating members. Fill out the consent form	10
				<Health perceptions and responsibility & self-esteem and self-efficacy> • Information: - The definition and meaning of health, the concept of health promotion, the conditions affecting health - The definition of self-esteem and self-efficacy, the importance of healthy self-esteem and self-efficacy in health promotion - Implications of different perceptions of health - Introduce healthy lifestyle behaviors, risk behaviors on international students, and consequences • Sharing participants: - Views of health, the personal responsibility to care for each one health - Experiences in choosing a healthy lifestyle • Discussion session: - Evaluate the perceived barriers to take care of their health - Lifestyle factors affect health when living	20

Weeks	Topic	Delivery setting	Contents/ duration (min)		
				in Korea - Several strategies can help participants avoid health risks - Strategies to improve strengths and reduce weakness, efforts to improve self-esteem	
				<Pre-test> questionnaire, step data (Cashwalk app), and measuring blood indicators	30
		Individual	Content & method	• Telehealth coaching: encourage them to prevent health risk factors and choose healthful behaviors	10
2	Accessibility to healthcare service	Group	Target	• Improve the use of available resources to help them increase their healthy lifestyle at the university • Understand Health Insurance; Prepare to get access to the healthcare system while studying in Korea	
			Contents & methods	<Information> • Identifying needs and barriers • Provide information on services that can be used on campus when you have health problems • Introduction importance and benefit of health insurance for international students < Sharing participants> • Sharing experiences and difficulties on the use of campus support services as well as the Korean healthcare system on health issues <Discussion session> • Some solutions to improve accessibility and use available resources to improve healthy lifestyle in university • Maintaining support for individuals and groups • Checklist provided	30
		Individual	Content	• Telehealth coaching: Encourage participants	10

Weeks	Topic	Delivery setting	Contents/ duration (min)		
			& method	to increase healthy lifestyles	
3	Adequate and balanced nutrition	Group	Target	• Increase information about the consequences of eating behavior • Self-management of nutrition: Eating healthy	
			Contents & methods	<Information> • Introduction to eating habits and healthy nutrition • Information about balanced and unbalanced diet and their consequences • Basic food groups, food safety and hygiene, and age-appropriate nutrition • Provide nutritional information and facilitate the identification of easy ways to adopt healthy nutrition with their resources and context < Sharing participants> • Participants share and analyze their eating habits. Challenges of eating and how to maintain a healthy diet when studying in Korea <Discussion session> • Some solutions to improve eating habits and healthy nutrition • Checklist provided	40
		Individual	Content & method	• Telehealth coaching: Encourage them to prevent health risk factors and choose healthful behaviors	10
4	Physical activity	Group	Target	• Understand the benefits of regular physical activity • Practice ways to improve physical activity in your daily life • Increase the level of activity intensity	
				< Sharing participants> • Participants share their physical activity	40

Weeks	Topic	Delivery setting	Contents/ duration (min)		
			Contents & methods	habits. Identify sedentary activities and try to minimize them <Information> • Introduction to physical activity and body consequences • Presentation of some programs of physical activity (flexibility activities, muscle-strengthening activities, and bone-strengthening activities) <Exercise program > • Badminton group (2 hours/ week) • Walking program with pedometer app (target goal of 10,000 steps per day, equivalent to 30 minutes of walking per day) • Practice the first session at the badminton yard at the physical education department. • Schedule for the next practice session • Checklist provided	
		Individual	Content & method	• Telehealth coaching: Encourage them to prevent health risk factors and choose healthful behaviors	10
5	Stress management	Group	Target	• Understand the common causes, signs and symptoms of stress • Identify ways to manage and reduce stress by yourself	
			Contents & methods	<Information> • The definition of stress and negative effects of stress • The factors that caused the stress to the international students • Introduction stress management methods < Sharing participants> • Sharing own experiences on managing	40

Weeks	Topic	Delivery setting	Contents/ duration (min)		
				stress. <Stress management program> • Stress management techniques: deep breathing, the imagery, the thinking stop method, muscle relaxation <Exercise program > • Play badminton • Schedule for the next session • Checklist provided	
		Individual	Content & method	• Telehealth coaching: Encourage participants to increase physical activity and maintain the learned stress management technique.	10
6	Social support; Interpersonal relations and effective communication	Group	Target	• Students create, develop, and maintain their social networks over time and effective communication when living and studying in Korea.	
			Contents & methods	<Information> • The definition of social support and received social support and the role of social support when living and studying abroad • Identify the importance of communication in the interpersonal relations • Emphasize the importance of intercultural communication • Introduction principles of effective communication and some suggestions for nurturing your relationships, cultivating and dultivating your social support network. < Sharing participants> • Share participants' experiences receiving social support and communication when living in Korea and how difficult it is to create, develop, and maintain their social	30

Weeks	Topic	Delivery setting	Contents/ duration (min)		
				networks when studying abroad. <Discussion session> • Several ways can help participants create, develop, and maintain their social networks over time and effective communication when living and studying in Korea. • Interpersonal skill training: extracurricular and club activities. Participate in school activities such as student union, buddying scheme, and peer group (maintain activities through the semesters) <Exercise program > • Play badminton • Schedule for the next session <Stress management program> • Practice stress management techniques, deep breathing, imagery, the thinking stop method, muscle relaxation • Checklist	
		Individual	Content & method	• Telehealth coaching: Encourage participants to increase healthy lifestyles	10
7			Target	• Understand the benefits of leisure activities. • Acculturation strategies, adapting to a new culture	
			Contents & methods	<Information> • Habits relevant to the health of international students and consequences • Importance of healthy habits in health promotion. Encourage healthy babits • Introduce the leisure and culture-related activities, the role and health benefits of leisure activities	30

Weeks	Topic	Delivery setting	Contents/ duration (min)		
7	Healthy habits, leisure activities, and cultural adaptation	Group		• Introduce acculturation • The role of cultural adaptation; acculturation affects international students' health behavior • The participants discuss: Several strategies that can help participants improve a healthy habit, leisure activities experienced when living in South Korea, acculturation strategies, adapting to a new culture <Exercise program > • Play badminton • Schedule for the next session <Stress management program> • Practice stress management techniques, deep breathing, imagery, the thinking stop method, muscle relaxation • Checklist	
		Individual	Content & method	• Telehealth coaching: encourage participants to increase healthy lifestyles	10
8	A healthier tomorrow	Group	Target	• Evaluate the effectiveness of the health promotion program	
			Contents & methods	• Continue integrating health promotion into the everyday life • Summary of the promotion program. • Share your experience of participating in the program • Post-test: Questionnaire, step data (Cashwalk app) and blood indicators	40
		Individual	Content & method	• Telehealth coaching: Encourage participants to increase healthy lifestyles	10

Control group training contents

Week	Topic	Delivery setting	Contents/ duration (min)		
1	Getting started, Health promotion and lifestyle education	Group	Target	• Understand the purpose and process of health promotion program. • Conduct a pre-test before starting. • Participants greet and share individual with participating members	
			Contents & methods	• Research purpose and importance of the study. • Program schedule, content description • Fill out the consent form • Health promotion and lifestyle • Pretest: questionnaire, step data (Cashwalk app) and measuring blood indicators	60
8	Post-test	Group		• Summary of the promotion program • Posttest: Questionnaire, step data (Cashwalk app) and blood indicators	40

< Appendix 4> Checklist for healthy lifestyle practice.

The following checklist about your healthy lifestyle practice. Please read carefully and check which apply to your daily life.

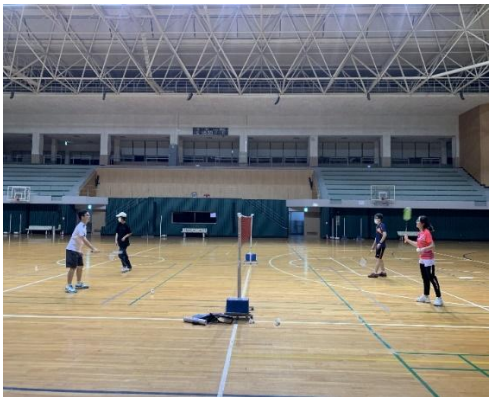
Name: .....

No	Content		Mon	Tue	Wed	Thu	Fri	Sat	Sun
1	Physical activity (badminton, football, jogging, volleyball...)								
2	30+ minutes of exercise (walking, bicycle riding, jumping rope, running, climbing, taking the stairs)								
3	Vitamin and mineral supplements, Eat more than two servings of vegetables and fruits								
4	Water intake								
5	Breakfast								
6	Luch								
7	Dinner								
8	Don't drink, Don't smoke								
9	Snacks and fast foods								
10	Low-cholesterol, low-fat foods								
11	Stress management	Diaphragmatic breathing							
		Image method							
		Progressive muscle relaxation							
		Positive thinking							
		Other methods							

No	Content		Mon	Tue	Wed	Thu	Fri	Sat	Sun
		you apply to relax or reduce stress:							
12	Physical activity diary (app)								
	Steps								
	Times								
	Burning calories								
	Distance								

○ Excellent △ average × poor

<Appendix 5> **Experimental group program pictures**



Development and Evaluation of a Campus-based Health Promotion Program (CamHPP) for Vietnamese Students in Korea: A Randomized Controlled Trial

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(Abstract)

This study aimed to develop a campus-based health promotion program (camHPP) for Vietnamese students in Korea and analyze the program's effects by a randomized controlled trial with the pretest-posttest control group design. The data were collected from May 1st to September 15th of 2022. The preliminary assessment was performed with 56 Vietnamese students and 27 students were selected as the experimental group and 28 students were selected as the control group. SPSS Statistics 20.0 was used to analyze the data. The chi-square, Fisher’s exact, and Mann-Whitney tests were used to test for homogeneity. The Mann-Whitney and Wilcoxon signed-rank tests were used for hypothesis testing, and the reliability test was performed through Cronbach' alpha coefficient.

The results of the study were as follows:

The first hypothesis: "The experimental group will be a higher level of health perception than the control group" was tested. There were significant differences between the groups in health perception level (U=224.00, p=.033). Therefore, the first hypothesis was supported.

The second hypothesis: "The experimental group will show higher level of social support than the control group" was tested. There were significant differences between the groups in social support scores (U=165.50, p<.001). Therefore, the second hypothesis was supported.

The third hypothesis: "The experimental group will show higher level of health care services access than the control group" was tested. There were significant differences between the groups in health care services access score (U=350.50, p=.024). Therefore, the third hypothesis was supported.

The fourth hypothesis: "The experimental group will show higher level of health-promoting behavior than the control group" was tested. There were significant differences between the groups in health-promoting behavior score (U=148.00, p<.001). Therefore, the fourth hypothesis was supported.

The fifth hypothesis: "The experimental group will show lower level of perceived stress than the control group" was tested. There were significant differences between the groups in perceived stress score (U=280.50, p=.014). Therefore, the sixth hypothesis was supported.

The sixth hypothesis: "The experimental group will show optimal level of lifestyle-related biochemical indicators than the control group" was tested. There were significant differences between the groups in TG (U=135.00, p<.001), total cholesterol (U=230.00, p<.001), HDL-C (U=125.50, p=.042), LDL-C (U=215.00, p<.001), serum cortisol (U=134.00, p=.043).There were no significant differences in Hb, Hct, WBC, RBC. Therefore, the fifth hypothesis was partially supported.

The seventh hypothesis: "The experimental group will show higher level of quality of life than the control group" was tested. There were significant differences between the groups in quality of life score (U=248.00, p<.001). Therefore, the seventh hypothesis was supported.

The CamHPP improves the health perception, social support, health care services access, health promotion behavior, subjective physical and biochemical

indicators, perceived stress and the quality of life of Vietnamese students. This study highlights the importance of developing specific tasks that promote health among international students and promoting healthy habits. The CamHPP proved to be an effective intervention to improve health promotion behavior and quality of life for Vietnamese student studying in Korea.

재한 베트남 유학생을 위한 캠퍼스기반-건강증진 프로그램 (CamHPP)의 개발 및 효과 검증: 무작위 대조군 전후 실험 설계

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(초록)

본 연구는 재한 베트남 유학생을 대상으로 캠퍼스기반-건강증진 프로그램 (CamHPP)을 개발하고 그 효과를 검증하기 위해 시도된 무작위 대조군 전후실험설계 연구이다. 자료수집기간은 2022년 5월 1일부터 9월 15일 사이에 이루어졌으며, 연구대상자는 한국의 일 대학에서 유학중인 베트남 유학생 55명으로 CamHPP 적용군인 실험군에 27명, 대조군에 28명으로 무작위 배정하였다. 자료분석은 SPSS Statistics 20.0을 이용하여, 사전 동질성 검정은 Chi-square test, Fisher's exact test 및 Mann-Whitney test로, 가설검정은 Wilcoxon signed-rank test와 Mann- Whitney test로 분석하였고 신뢰도 검정은 Cronbach′ alpha 계수로 분석하였다.

연구결과는 다음과 같다.

제1가설: "실험군은 대조군보다 건강 인식 수준이 더 높을 것이다"를 검증한 결과, 건강 인식 수준의 변화는 중재후 집단간 유의한 차이가 있었다(U=224.00, p=.033). 따라서 제1가설은 지지 되었다.

제2가설: "실험군은 대조군보다 수준의 의료 서비스 접근성이 더 높을 것이다"를 검증한 결과, 의료 서비스 접근성의 변화는 중재후 집단간 유의한 차이가 있었다(U=165.50, p<.001). 따라서 제2가설은 지지되었다.

제3가설: "실험군은 대조군보다 사회적 지지 수준의 더 높을 것이다"를 검증한 결과, 사회적 지지의 변화는 중재후 집단간 유의한 차이가 있었다 (U=350.50, p=.024). 따라서 제3가설은 지지되었다.

제4가설: "실험군은 대조군보다 건강증진행위 점수가 더 높을 것이다"를 검증한 결과, 건강증진행위 점수는 중재후 집단간 유의한 차이가 있었다(U=148.00, p<.001). 따라서 제4가설은 지지되었다.

제5가설: "실험군은 대조군보다 지각된 스트레스 수준이 낮을 것이다" 를 검증한 결과, 지각된 스트레스 수준이 중재후 집단간 유의한 차이가 있었다(U=280.50. p=.014). 따라서 제6가설은 지지되었다.

제6가설: "실험군은 대조군보다 최적의 생화학적 지표를 보일 것이

다" 를 검증한 결과, 중재후 실험군은 대조군보다 TG (U=135.00, p<.001), TG (U=230.00, p<.001), HDL-C (U=125.50. p=.042), LDL-C (U=215.00, p<.001), 혈청 코티솔(U=134.00, p=.043) 수준에서 통계적으로 유의한 차이가 있었으나, Hb, Hct, WBC, RBC은 유의한 차이가 없다. 따라서 제5가설은 부분적으로 지지되었다.

제7가설: "실험군은 대조군보다 삶의 질 수준이 높을 것이다"를 검증한 결과, 삶의 질의 변화는 중재후 집단간 유의한 차이가 있었다 (U=248.00, p<.001). 따라서 제7가설은 지지되었다.

이상의 결과로 재한 베트남 유학생을 위한 8주간의 CamHPP는 대상자의 건강 인식, 의료 서비스 접근성, 사회적 지지, 건강증진행위, 생화학적 지표, 지각된 스트레스, 삶의 질향상에 효과적인 중재임이 확인되었다. 따라서 CamHPP를 한국에 유학중인 다양한 국가에서 온 유학생들에게 확대 적용할 필요가 있다.