

## Original Research



# Who has a high level of food literacy, and who does not?: a qualitative study of college students in South Korea

Hyelim Yoo <sup>1,2</sup>, Eunbin Jo <sup>1,2</sup>, Hyeongyeong Lee <sup>1,2</sup>, Eunji Ko <sup>1,2</sup>, Eunjin Jang <sup>1,2</sup>,  
Jiwon Sim <sup>1,2</sup>, and Sohyun Park <sup>1,2§</sup>

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### §Corresponding Author:

Sohyun Park

Department of Food Science and Nutrition,  
Hallym University, Life Science Building #8521,  
1 Hallymdaehak-gil, Chuncheon 24252, Korea.  
Tel. +82-33-248-2134  
Fax. +82-33-256-3420  
Email. [sopark@hallym.ac.kr](mailto:sopark@hallym.ac.kr)

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### ORCID iDs

Hyelim Yoo   
<https://orcid.org/0000-0003-4279-7823>  
Eunbin Jo   
<https://orcid.org/0000-0003-2851-4364>  
Hyeongyeong Lee   
<https://orcid.org/0000-0003-2360-2947>  
Eunji Ko   
<https://orcid.org/0000-0003-1486-1007>  
Eunjin Jang   
<https://orcid.org/0000-0003-3926-4575>  
Jiwon Sim   
<https://orcid.org/0000-0003-2381-8641>  
Sohyun Park   
<https://orcid.org/0000-0001-6009-1002>

<sup>1</sup>Department of Food Science and Nutrition, Hallym University, Chuncheon 24252, Korea

<sup>2</sup>The Korean Institute of Nutrition, Hallym University, Chuncheon 24252, Korea

## ABSTRACT

**BACKGROUND/OBJECTIVES:** Unhealthy food choices among young adults are common globally, and the incidence of chronic diseases, such as obesity, is rising. Food literacy (FL) is important for improving and maintaining individual health in a rapidly changing food environment and can form the basis for following a sustainable diet. Therefore, it is essential to improve FL among young adults, particularly college students, who are in the formative years of their lifelong food habits. This study examined the facilitators and barriers of FL and related dietary behavior among college students in South Korea.

**SUBJECTS/METHODS:** This study recruited 25 college students with different residence types using convenience and snowball sampling. In-person, telephone, and video interviews were conducted from March to November 2021. The interview data were analyzed using framework analysis based on the socio-ecological model.

**RESULTS:** At the individual level, prior good experiences with food were the most frequently mentioned facilitator. In contrast, the major barriers were a lack of knowledge, financial hardship, irregular schedules, and academic stress. At the interpersonal level, the influences of family and peers, such as early exposure to healthy eating habits and opportunities to have easy accessibility to farms and farming, are major facilitators, but the lack of a sense of community was the major barrier. At the environmental level, the major barriers were unfavorable food environments at home and in neighborhoods, such as the absence of kitchens in housing and large packaging of produce at markets.

**CONCLUSIONS:** Many factors affected the students' FL and related healthy eating practices. These findings suggest that a campus-based FL program should be developed by reflecting on these facilitators and barriers.

**Keywords:** Food; literacy; eating behavior; young adult; qualitative research

## INTRODUCTION

There is a conventional belief that young adults have the best health conditions among the adult population. In many cases, however, young adults are exposed to many health risks during college. In the US, data have shown that college students have a high prevalence of obesity and are likely to develop unhealthy behaviors, such as smoking and drinking [1,2].

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**Conflict of Interest**

The authors declare no potential conflicts of interests.

**Author Contributions**

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The college years can be one of the most important times in life for building healthy dietary choices because it is often the first time that young adults leave their families and start to make their own food decisions independently [3]. On the other hand, it is common for college students to choose unhealthy meals, such as fast food, or to skip meals [4]. Poor eating habits developed at this stage can harm the individuals' long-term health [5].

According to the Korea National Health and Nutrition Examination Survey in 2020, the prevalence of skipping breakfast was 58.4% for men and 58.0% for women among people in their 20s, which is the highest prevalence among the adult population. Furthermore, 12.3% of people in their 20s reported consuming more than 500 g of fruit and vegetables daily, the lowest percentage among adults [6]. In the 2020 Seoul Food Survey, the frequencies of using convenience foods and sweetened beverages were the highest in people in their 20s. Moreover, 9.6% of people in their 20s answered that they experienced food insecurity, which is defined as “not having sufficient foods in quantity and quality.” This was the second largest percentage found among adult populations after those in their 70s and older [7]. The Korean Healthy Eating Index also shows the lowest scores for young people in their 20s [8].

Research on food literacy (FL) has gained significant momentum recently, but many definitions exist in the literature. For example, Vidgen and Gallegos [9] defined FL as food-related knowledge, skills, and behaviors for a healthy diet, whereas Cullen *et al.* [10] defined it as the ability to develop positive relationships with food by considering various factors along with food skills and behavior within the food system. Many studies have focused on functional FL, which emphasizes food-related information acquisition and understanding, as well as food selection and consumption for individual health [11].

Considering the recent climate crisis and food environment changes, a broader concept of FL is needed to select food sustainably, considering cultural, community, social, and environmental values. In this context, the current authors proposed a broad definition of FL as “*the ability to select, prepare, and cook food to promote an individual healthy lifestyle and food-related competencies that understand the cultural value of food, and consider the value of food to the community, agriculture, and the environment*” [12].

Social cognitive theory emphasizes that an individual's cognitive factors, environmental factors, and interplay influence their behaviors [13]. Previous research has supported this theory and confirmed the relationship between low FL and suboptimal health behaviors and outcomes. For example, a low-quality diet is a significant risk factor for chronic diseases, such as obesity [14], which is associated with low food and nutrition literacy. Furthermore, individuals with low FL are more likely to have a low intake of healthy foods, such as fruit and vegetables, a high intake of take-out foods and sweetened drinks, and a higher prevalence of chronic diseases, such as obesity [15,16]. In contrast, individuals with high FL are more likely to consume breakfast, choose healthier foods with less salt and sugar, and experience better health outcomes [15,17,18]. FL can significantly impact an individual's ability to make healthy and sustainable food choices, profoundly impacting their overall health and well-being [15,19]. Therefore, it is crucial to promote the development of FL among young adults, particularly college students, who are in the formative stage of their lives and can establish lifelong food habits [20,21].

Identifying the key factors influencing FL and healthy dietary behaviors is crucial for promoting sustainable diets and well-being among college students. Previous studies have highlighted several facilitators and barriers to healthy eating practices and FL among college students. Most of these studies focused on the functional aspects of FL that affect dietary choices, such as cooking skills, nutritional knowledge, and environmental influences that affect these functional FL [20,22-25]. Considering the deteriorating climate crisis in recent years, young people must grasp the interplay between diet, health, and the environment. While understanding the facilitators and barriers of the functional aspect of FL is important, this alone is insufficient for comprehending the context of college students. Therefore, other contextual factors must be considered when designing future interventions that improve FL with a more comprehensive definition.

Begley *et al.* [16] reported that it is essential to consider the participants' characteristics and identify those who can benefit the most from FL programs. Therefore, building on the broad definition of FL discussed above, understanding the contextual factors, including the social and environmental aspects of food choices and the sense of community among college students in South Korea, is critical for enhancing FL and promoting healthy dietary behaviors. This area has not been explored thoroughly. This study examined the facilitators and barriers to FL and dietary behaviors among college students in South Korea.

## SUBJECTS AND METHODS

### General study design and theoretical framework

In-depth interviews were conducted to identify facilitators and barriers to FL among Korean college students. The interview guide used the social-ecological model (SEM) as a guiding framework (**Fig. 1**) [26,27]. The SEM emphasizes the interrelationship of individual and social environmental factors with human behavior for health promotion [27]. This model assumes that changes in social environmental factors cause changes in individuals. Moreover, individual support is essential for changes in environmental factors. The model also emphasizes the importance of intervention in changes in interpersonal relationships, organizations, communities, and public policy, which are factors that cause unhealthy behaviors [26].

The interview protocol was developed based on the proposed broad FL concept and existing FL and diet qualitative studies to identify the factors affecting the FL and diet competence of college students [12,22,23,28,29]. Interview questions were structured into individual, interpersonal, and environmental factors according to the SEM framework. The interview started with questions about individual factors and expanded to environmental factors. **Fig. 1** shows the interview guide used in the study.

### Recruitment and interview process

From March to November 2021, 2 trained interviewers (the first and corresponding authors of this paper) conducted 25 face-to-face interviews. One of the interviewers was a graduate student who had taken a graduate-level course in qualitative research; the other was a professor trained in qualitative data collection methods and conducting qualitative studies for more than 10 years. Telephone and video interviews were conducted if the interviewees could not meet in person. The participants were recruited by posting a flyer on the Web bulletin board frequently accessed by college students. The flyer explained the purpose of the

study, the interview process, and the compensation offered (a coupon for beverages worth 10,000 Korean won). The participants were between 20 and 27 years old. The participants had various living arrangements, such as living with family, living alone, and living in dormitories. **Table 1** lists the interviews and the list of participants.

**Individual-level:**

- Question 1: ‘Please tell me about your daily life and your eating occasions.’
- Question 2: ‘What do you think is the most important thing when choosing what to eat?’
- Question 3: ‘Tell me about your experiences in learning how to cook or learning nutrition knowledge.’
- Question 4: ‘If you were to give a score from 1 to 10 to your diet, how many points would you give to yourself?’  
‘Why do you think so?’

**Relationship/Interpersonal-level:**

- Question 5: ‘Do you usually enjoy various and new foods?’ ‘What are the main barriers or facilitators to yours enjoyment?’
- Question 6: ‘What kind of meal settings make you happy?’ ‘What does ‘eating together’ mean to you?’
- Question 7: ‘What do you think about the setting/occasions where you can learn how to cook, eat and talk with others?’  
‘Why do you think so?’

**Environmental-level:**

- Question 8: ‘What do you think of the campus cafeteria? Why do you think so?’
- Question 9: ‘Tell me about your opinions or experiences with animal welfare products, organic products, packaging and food waste, and vegetarianism.’
- Question 10: ‘Do you understand the concept of fair-trade products? Please tell me your experiences with fair-trade food items.’

**Fig. 1.** In-depth interview guide to understand the facilitators and barriers affecting the healthy diet and food literacy of college students.

**Table 1.** Key information of the study participants

Interview #	Gender (Man/Woman)	Age	Grade	Type of residence	University
1	M	26	4	Living with parents	A
2	W	24	4	Dormitory	A
3	M	23	3	Living with parents	B
4	M	22	3	Dormitory	A
5	M	25	2	Dormitory	A
6	W	24	4	Living alone	A
7	M	25	4	Living with parents	A
8	M	27	4	Living alone	A
9	W	23	1	Dormitory	A
10	M	20	1	Dormitory	A
11	W	23	3	Living alone	A
12	W	21	2	Living alone	A
13	W	22	3	Dormitory	A
14	W	22	3	Living with parents	C
15	W	22	3	Living with parents	A
16	W	22	3	Dormitory	C
17	W	20	1	Dormitory	A
18	M	25	3	Living alone	D
19	W	23	3	Living with parents	A
20	M	23	4	Living with parents	E
21	M	23	4	Living with parents	F
22	M	25	4	Living alone	G
23	W	22	3	Living alone	H
24	M	26	4	Living alone	E
25	W	24	4	Living with parents	A

The saturation sampling method was used in this study. Saturation sampling is a qualitative sampling method that recruits participants until no new information is available in the interview [30-32]. Two out of 15 people who applied for an interview during the initial data collection phase could not participate. Therefore, 13 students completed the interviews. Twelve more interviewees were recruited in addition to these 13 initial interviewees using a snowball sampling method to collect data on students with various sociodemographic characteristics [33,34]. The 2 characteristics that were underestimated in the first round of interviews were gender (man) and residence type (living with family). All interviews took approximately 40–60 minutes; additional interviews were conducted if more content was required after the first interview. The interview guide was an open-ended question format exploring the factors related to the participants' overall diet and FL, as well as the factors that facilitated or interfered with their healthy dietary practices. The interviews were conducted at a convenient time for the participants, and face-to-face interviews were conducted in the study room of the campus library. The interviews were recorded digitally for transcription with the participants' approval. The interviews were transcribed verbatim, and the interviewers reviewed the transcripts for accuracy. The study protocol was approved by the Hallym University Institutional Review Board (HIRB-2021-009).

### Data analysis

For the interview data, Microsoft Excel (version 16.0; Microsoft Corporation, Redmond, WA, USA) was used for framework analysis. Framework analysis is a method that allows researchers to visualize the dataset overall to help them understand, interpret it easily, and compare the associations through an analysis of the within-case and between-case relationships [35,36]. Before data analysis, 3 main domains of FL (presented in **Table 2**) were used to group the facilitators and barriers with the participants' levels of FL. After putting the text data into the chart, the participants' data were compared and classified into positive and negative factors. The emerging individual, interpersonal, and environmental themes were then evaluated. Member checking and peer debriefing were implemented throughout the study to ensure the credibility of the data analysis. For example, the preliminary results were shared with the interviewees. Weekly meetings were held with the research team to review

**Table 2.** Key facilitators and barriers to having a high level of FL in the 3 main domains of FL among university students

Variables	Nutrition and safety FL <sup>1)</sup>	Cultural and relational FL <sup>2)</sup>	Socio-ecological FL <sup>3)</sup>
Facilitators	<ul style="list-style-type: none"> <li>▪ Acquisition of knowledge (school class, YouTube, part-time job)</li> <li>▪ Having had good hands-on experiences in the past                             <ul style="list-style-type: none"> <li>- Joyful cooking experiences</li> <li>- Weight control, management of disease experience</li> </ul> </li> <li>▪ Influence of family and peers                             <ul style="list-style-type: none"> <li>- Early exposure to healthy eating habits</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>- A lot of cooking experiences</li> <li>- Various foreign cultural experiences</li> <li>- Family and friends who enrich the happiness of eating together</li> </ul>	<ul style="list-style-type: none"> <li>- Farming experiences</li> <li>- Experience taste differences of fresh, seasonal food, and organic products</li> <li>- The seriousness of food waste and package waste through part-time work at restaurants</li> <li>- Extra-curricular activities (environmental issues related to foods)</li> <li>- Opportunities to have easy accessibility to farms and farming</li> </ul>
Barriers	<ul style="list-style-type: none"> <li>▪ Lack of knowledge</li> <li>▪ Financial hardship/high price of healthy foods</li> <li>▪ Irregular schedules and academic stress</li> <li>▪ Unfriendly food environment at home (living alone environment, the absence of a kitchen in small houses)</li> <li>▪ Unfriendly food purchasing environment in campus and neighborhoods                             <ul style="list-style-type: none"> <li>- Dissatisfaction with campus cafeterias</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>▪ Lack of cooking experience</li> </ul>	<ul style="list-style-type: none"> <li>▪ Lack of sense of community</li> <li>- Lack of accessibility to food grocery stores</li> <li>- A large amount of food package</li> </ul>

FL, food literacy.

<sup>1)</sup>The ability to acquire, understand, and use knowledge and information related to food and nutrition; <sup>2)</sup>The ability to understand various food culture values and pursue enjoyment and meaning through food; <sup>3)</sup>The ability to consider community, agriculture, environmental and ecological consequences related to individual food choices.

the analysis process and verify the emerging themes. The research team collectively reviewed the themes, and any necessary adjustments were made following a roundtable discussion. In cases of discrepancies, a consensus was reached through collaborative efforts. The recruitment of new participants was stopped when the research team determined that data saturation had been achieved based on the consensus among all team members.

## RESULTS

The facilitators and barriers that affect the dietary competency and FL of college students were classified into 3 levels from the perspective of the SEM, and the main facilitators and barriers were as follows (**Table 2**). **Table 2** lists the core themes because some factors overlapped and were repeated in 3 domains.

### Individual-level factors

#### *Facilitator factors*

Theme 1. Having had good hands-on experiences in the past

Previous good experiences were the major facilitators of high levels of FL among college students. This factor was related to all 3 main domains of FL. The subjects who had previously had good experiences, such as happy cooking experiences, pleasant memories of eating with others, various foreign cultural experiences, and farming experiences, were associated with better FL and competency. They had no resistance to cooking, enjoyed new foods, and enjoyed sharing food or eating with others. In addition, they thought positively about using organic and animal welfare products; they particularly enjoyed fruit and vegetables without resistance when they had experience in farming. This quote below explains the moment when a student could enjoy vegetables and fruits through past farming experiences.

“When I was in elementary school, I went to a weekend farm with my parents. I think the experience is important. I think it was fun to harvest, and it felt worthwhile. I remember these things being fun and enjoyable. I think that is one of the reasons that I still enjoy eating fruit and vegetables.” [Interview #6, woman, junior student]

Experience through part-time jobs, school classes, and extra-curricular activities also had positive influences. Some students learned about the problems of food and packaging waste when they worked part-time at restaurants. Through such extra-curricular activities, they become more aware of food-related environmental issues. As a result, the students explained that they had started to use travel mugs for their beverages more often. Some interviewees mentioned that during classes, they had previously had the chance to taste animal welfare products and compare them with conventional products. Based on these experiences, they started to try to buy animal welfare products when they went grocery shopping. In addition, the classes also had a positive impact on students when they experienced the taste differences when trying fresh, seasonal food and organic products. The quote below explains the experience when a junior woman student tasted different eggs from different types of farms.

“It was the most memorable class in college so far. I think I had a lot of fun. It was a class where I could compare and eat various products. The professor prepared all the eggs from grades 1 to 4 and animal welfare eggs so that we could eat and taste them. I told my mother what I felt during that class, and after that, I have been eating animal welfare eggs regularly.” [Interview #14, woman, junior student]

### *Barriers*

#### Theme 2. Lack of knowledge

The participants had different levels of dietary competency and literacy because of their level of knowledge. Students with substantial knowledge had positive opinions on environmentally sustainable diets, animal welfare products, and fair trade products, as well as their use in their diets. On the other hand, most students lacked knowledge about a healthy diet and food. They were unaware of the importance of preparing their meals, including fruit and vegetables in their healthy diet and checking nutrition labels when purchasing food. There was also no significant interest in animal welfare products, fair trade products, sustainable diets, or other food-related environmental issues (such as food and food package waste). This quote below explains one student's idea of the importance of checking nutrition labels when purchasing food.

“I do not know what is different in nutrition labeling. I do not know what this represents and how it affects me. So I do not think I will understand what that means even if I check the labels.” [Interview #13, woman, junior student]

#### Theme 3. Financial hardship/high price of healthy foods

The most common barriers to diet competency and having FL were financial hardship. Many students stated that if they find their finances inadequate during a period, they either eat cheap meals or skip meals. They also used the word “cost-effectiveness” and said they do not consider the healthiness of their diet much. This quote below demonstrates when a student wanted to eat salad but had to choose a cheaper meal with fewer vegetables due to financial hardship.

“I really like a salad with lettuce. So when I really want to eat it, I eat sandwiches. The food price is so important because I earn money by working part-time. So, I look at the price first and eat cheap sandwiches when I want to eat vegetables.” [Interview #17, woman, junior student]

#### Theme 4. Irregular schedules and academic stress

Irregular schedules and academic stress were reported to interfere with healthy eating for college students. There were many cases of irregular living patterns, such as sleeping late, eating late-night snacks, waking up late, and skipping breakfast. Many students were aware of the problems related to irregular life patterns but preferred to sleep more instead of eating breakfast. Academic stress also had a considerable influence on their food choices. When students are stressed by exams, they tend to find greasy and stimulating foods on impulse, habitually snack, and binge eat. This quote below details how one student's food choices reportedly change when she is under stress.

“I think I am under a lot of stress for school work now. So, I think there are many times when I become stressed, and I order delivery food on impulse or suddenly eat a lot.” [Interview #12, woman, junior student]

### **Relationship/interpersonal-level factors**

#### *Facilitator factor*

Theme 5. Influence of the family and peers: early exposure to healthy eating habits and opportunities to have easy accessibility to farms and farming

At the interpersonal level, family and friends had a positive influence on a healthy diet and FL. In particular, the influence of parents was the most common response of the participants.

Parental influence made students eat regularly and consume fruit and vegetables frequently and helped them to have positive experiences, such as cooking or grocery shopping together. These students had better nutritional knowledge, a higher preference for fruit and vegetables, and greater willingness to try organic foods and animal welfare products. When family members or acquaintances engaged in farming, the students had more opportunities to encounter vegetables or fruits. Therefore, they often ate them or responded positively to buying food directly from farms. This quote below explains when a student became fond of fruit and vegetables because of her parents' influence.

“I think I always ate a lot of fruit and vegetables. I think it is because of my parents. I started to like fruit because my mom does not like processed foods, and I do not think I have any resistance because she cooks various vegetable dishes.” [Interview #9, woman, junior student]

### *Barriers*

#### Theme 6. Lack of a sense of community

Students emphasized the importance of creating a community where people can discuss ethical and sustainable eating practices. Students also said it is necessary to instill ethical consumption and ecological awareness regarding issues, such as fair-trade products, sustainable diets, vegetarianism to delay the climate crisis, and ‘container campaigns’ to reduce food packaging waste. This quote below explains a student’s opinion of how to practice a healthy and sustainable diet.

“I think creating a ‘together’ atmosphere is most important. I think the more people do so, the faster things will change. Therefore, I think it is important to develop an atmosphere or community that many people can participate in.” [Interview #15, woman, junior student]

### **Environmental level factors**

#### *Barriers*

Most of the environmental barriers mentioned by participants were more closely related to practicing FL than having a certain level of FL in the first place.

#### Theme 7. Unfriendly food environment at home: living alone, the absence of kitchens in small houses

An unfavorable food environment at home was a barrier to healthy eating and practicing their FL. There was a large difference in healthy diet practices and the level of FL depending on whether students lived with their parents, lived in a dormitory, or lived alone. Students who lived in dormitories and those who lived alone often mentioned the environment of eating alone or in single-person households. They reported eating more regularly when eating with others, but they ate poorly, such as skipping meals or eating simply, when they ate alone. Furthermore, many students who live in dormitories said that the absence of a kitchen is a barrier to practicing a healthy diet. They said the dormitory kitchens were poorly equipped, smelled bad, and did not have a food waste disposal environment. For these reasons, eating meals was stressful. Therefore, they said they ended up eating simple meals. This quote below explains the difference between a junior man student eating alone and with family or friends.

“I think I eat better when I eat with someone. If I eat with my family, I take out one more side dish; if I eat with my friends, I eat something better than when I eat alone.”



[Interview #1, man, junior student]

Theme 8. Unfavorable food purchasing environment in campus and neighborhoods: lack of accessibility to food grocery stores, a large number of food packages, dissatisfaction with campus cafeterias

An unfavorable food-purchasing environment was another barrier. Students said that when purchasing products, the package is too large for a single-person household, resulting in more food waste. In addition, they talked about problems, such as fair-trade, organic, and animal welfare products, which are difficult to find where they usually go grocery shopping. This quote below explains when a junior woman student could not easily access animal welfare products or organic products when grocery shopping.

“I do not think animal welfare and organic products are accessible near my house. I do not think I can find them easily. Only those who are interested know about them.”

[Interview #16, woman, junior student]

Campus cafeterias, which are supposed to offer balanced meals at reasonable prices, were reported to be another barrier to food-related competency. Most of the participants were unsatisfied with the meals offered by the campus cafeterias. The participants said they felt time-limited; the menu was not diverse, the portions were insufficient, and the food was tasteless. They said paying for something else with the same money would be better. Most students said they did not use the cafeterias often, even if they had difficulties finding good meal options around the campus.

## DISCUSSION

The college years are a critical time in the life of young adults because they form habits related to lifelong health and well-being during this time [20,37]. FL intervention programs for college students are rare compared to what is offered for other age groups, even though college years are important for developing healthy eating habits [38]. For example, most FL programs are offered for children [39], adolescents [40,41], adults [42], and people with specific diseases [43]. Morgan reported programs for college students to improve their FL and food security through the ability to plan, select, prepare, and cook food. Although food security was not increased significantly through the program, they concluded that self-efficacy and behaviors related to FL were improved, which could help reduce food security [37]. On the other hand, the abovementioned study focused on nutrition and safety, which are functional aspects of FL. There are no programs related to cultural and relational domains that maintain good relationships with food for a sustainable diet and are shared with people and socio-ecological domains to help them consider environmental sustainability.

Before developing an FL program for a sustainable and happy diet, this study examined the factors affecting college students' food-related competency and FL at the individual, interpersonal, and environmental levels from the perspective of the SEM. Facilitators and barriers were deeply interrelated at the individual, interpersonal, and environmental levels.

At the personal level, having prior good experiences was an important influencing the healthy and sustainable diet of college students. One participant reported that it is important to personally experience the feeling of having a better diet and trying something different.

Some existing dietary interventions contain a curriculum that allows people to have direct experiences, such as cooking classes or cooking camps; the subjects' dietary knowledge and behaviors were improved through such experiences [40,44]. In this study, subjects who had previously had positive dietary experiences could feel changes in their thoughts based on their experiences and further developed better dietary practices. Hence, empirical factors are seen as important for those lacking experience or having low FL.

In previous studies, many students have stated that they choose meals based on their financial means rather than what they need or want to eat [45]. This aspect was also the most frequently mentioned influencing factor by most interviewees in this study. On the other hand, many students said they desired to eat healthy meals or balanced meals that provide fruit and vegetables regularly or eat 3 meals daily. These individuals knew what a healthy diet was, but they made different choices because they prioritized economic factors. Therefore, developing an FL program that helps students have a healthy diet is necessary, considering economic factors, the most important influencing factor in their dietary decisions.

Many studies have reported that late bedtimes and stress can influence a diet; this study also confirmed that these factors have negative impacts, such as breakfast skipping and binge eating. Stress and insufficient sleep, which are the main factors triggering emotional eating, can eventually adversely affect a person's weight because such factors cause one to choose unhealthy foods with high calories [46-48]. Therefore, emotional eating due to irregular eating times and stress is a common problem for many college students. In this respect, it is necessary to develop a program that helps college students have a regular eating schedule, control their emotional eating, and manage their stress.

At the interpersonal level, the influence of family and peers was a major factor related to the level of FL. The college years are when students move away from their families and spend more time with their friends. According to existing studies, healthy eating programs with peer educators who can serve as role models help students respond better to dietary improvement [49]. Therefore, developing a program with peer educators that can offer positive experiences and influences can strengthen the capabilities of peer educators themselves and help college students pay more attention to and practice a healthy and sustainable diet.

For a sustainable diet, knowing how choices affect the environment and health is important [50,51]. Many students who participated in this study were unaware of the importance of vegetarianism and food waste. Environmental destruction and the climate crisis are becoming more serious issues [52,53]. In addition, making the right food choices in young adulthood is important because such choices can be a driving force for the next few decades regarding healthy and sustainable diets [54,55]. Therefore, it is necessary to provide students with an intervention program that shows how their choices influence important issues, why making good choices is necessary, and the importance of being together to choose food sustainably.

Many participants in this study cited the poor residential environment as a barrier to maintaining a healthy diet, which is consistent with findings from other qualitative studies conducted in different countries [56,57]. This highlights the need to improve the campus environment, such as having kitchens in dormitories or campus cafeterias. Participants living in dormitories and those living alone reported difficulties in having a healthy diet. Those living in dormitories, in particular, had challenges selecting healthy meals because of the lack

of a kitchen. Cooking and sharing food can be a positive way for students to bond together in a stressful and competitive college environment [45]. Therefore, it is crucial to have a communal space where students can plan, prepare, cook, and eat together, both on campus and in residential areas around the campus town.

Many studies have examined the diet of college students, but studies on FL are rare. Most of these studies focused on what the students ate the day before, what was most important to them when deciding what to eat, whether they thought they knew a lot about food, and how important food is to improving their quality of life [20,25]. Existing studies did not deal with FL in the broad sense, including food-related communities and social ecology, thereby making it difficult to identify these factors. To the best of the authors' knowledge, no study has examined the factors affecting FL in broader concepts involving key elements related to community, society, and ecology. Therefore, this study is meaningful in identifying the facilitator and barrier factors that affect FL, specifically making the right food choices by considering various emotional, relational, cultural, environmental, and ecological factors and individual health.

Although this study aimed to understand the college students' diet and FL, several limitations should be acknowledged. First, a majority (76%) of the sample was comprised of students from one university, potentially limiting the generalizability of these findings to all college students in South Korea. Furthermore, while an attempt was made to achieve diversity by recruiting participants from different types of residences, age groups, and genders, differences in background knowledge may have influenced the results. Nevertheless, interviews were conducted on students from colleges in other regions of the country to explore any significant differences in the responses, and no major thematic differences were found in these results.

Second, interviews were conducted during the outbreak of coronavirus disease 2019 (COVID-19), which may have influenced these results. Owing to COVID-19, some students were taking classes at home, while others were attending universities in different cities. As a result, some interviews were conducted by telephone or video (11 students, 44%). Telephone interviews may be more challenging than face-to-face interviews because of the limited nonverbal communication, such as nods or facial expressions, which could affect the accuracy and amount of information collected [58,59]. Furthermore, the pandemic may have influenced the content of the interviews. Nevertheless, general questions about FL and dietary choices were asked. If their responses appeared to be affected by the pandemic (such as the frequency of gatherings with friends and family around food), the interviewers probed whether their explanations would have been different before the pandemic.

Third, as a qualitative study, in-depth interviews offer the advantage of providing extensive information on individual experiences and establishing links between various topics. The participants should be selected carefully to avoid bias, and the analysis and interpretation should be conducted cautiously because of the difficulty in generalizing the results [60-62]. On the other hand, qualitative studies do not aim to generalize the results but to gain an in-depth understanding of the research questions. Therefore, this study fulfilled its objective of providing a detailed exploration of the factors influencing FL and dietary behaviors among college students in South Korea.

The study results showed that the diet and FL of Korean college students are influenced by factors at various levels, including individual, interpersonal, and environmental factors. This

suggests that many factors play key roles in FL and dietary behaviors. Unlike previous studies that focused on the functional aspects of food selection and consumption for individual health, the present study is significant in identifying the influencing factors that promote sustainable diets considering cultural, relational, social, and ecological aspects. Based on these findings, future interventions should aim to enhance the facilitators of FL and mitigate or modify the barriers to FL among college students. As FL and food choices of younger generations become increasingly important in the era of the climate crisis and rising medical costs due to chronic diseases associated with diet, the research results can be leveraged to design targeted FL interventions for college students that promote individual, community, and global health.

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