Factors associated with food choice among high school students
in Depok, Indonesia

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จุฬาลงกรณ์มหาวิทยาลัย
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ปัจจัยที่เกี่ยวข้องกับการเลือกบริโภคอาหารของนักเรียนระดับมัธยมศึกษาตอนปลายในเมืองเดปก ประเทศอินโดนีเซีย

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สยาริฟาห์ อควิลาห์ : ปัจจัยที่เกี่ยวข้องกับการเลือกบริโภคอาหารของนักเรียนระดับมัธยมศึกษาตอนปลายในเมืองเดปก ประเทศอินโดนีเซีย. (Factors associated with food choice among high school students in Depok, Indonesia) อ.ที่ปรึกษาหลัก : อนุชิต ภาณุมาสวิวัฒน์, อ.ที่ปรึกษาร่วม : ณัฏฐา ฐานีพานิชสกุล

บทนำ: สุขภาวะที่ดีของวัยผู้ใหญ่ มาจากพฤติกรรมการบริโภคในช่วงวัยรุ่น ในปัจจุบันนี้การใช้ชีวิตแบบเร่งรีบของวัยรุ่นนำไปสู่การบริโภคอาหารแบบไม่ปกติและส่งผลต่อปัญญาภาวะโภชนาการเกิน ดังนั้นการเลือกบริโภคอาหารถูกศึกษาเพื่อการปรับปรุงสภาวะโภชนาการของวัยรุ่น วัตถุประสงค์: เพื่อสำรวจการเลือกบริโภคอาหารของกลุ่มนักเรียนระดับมัธยมศึกษาตอนปลาย ณ เมืองเดปก ประเทศอินโดนีเซียและระบุถึงปัจจัยที่เกี่ยวข้องของการเลือกบริโภคอาหาร วิธีการทดลอง: วิธีการศึกษาแบบตัดขวางโดยใช้แบบสอบถามออนไลน์ผ่านระบบส่งข้อความแบบทันทีถูกศึกษาในระหว่างเดือนเมษายนถึงพฤษภาคม 2563 การเลือกบริโภคอาหารถูกสังเกตผ่านแบบสอบถามการเลือกบริโภคอาหารและถูกวิเคราะห์ด้วยวิธีการวิเคราะห์องค์ประกอบเชิงสำรวจ แบบสอบถามทั้งหมดในการศึกษาครั้งนี้ถูกทดสอบสำหรับความถูกต้องและความน่าเชื่อ การตรวจสอบความสัมพันธ์ระหว่างปัจจัยและการเลือกบริโภคอาหารได้ใช้วิธีการวิเคราะห์การถดถอยพหุคูณ ผลการทดลอง: ได้ทำการเก็บแบบสอบถามจากการตอบของนักเรียนระดับมัธยมศึกษาตอนปลายจำนวน 433 คน โดยอัตราจากการตอบแบบสอบถามในการศึกษาครั้งนี้ประมาณร้อยละ 89.6 จากการตอบทั้งหมด (483 คน) ที่ผ่านเกณฑ์คัดเลือกเข้าของกลุ่มตัวอย่าง สำหรับข้อมูลส่วนบุคคลของผู้ร่วมการศึกษาพบว่า อายุเฉลี่ยของนักเรียน คือ 16 ± 0.91 ปี ในส่วนของระดับโภชนาการได้แสดงถึงนักเรียนที่มีน้ำหนักเกินและอ้วน (z-score > 1 SD) คิดเป็นร้อยละ 14.1 สำหรับการรับรู้ของภาพลักษณ์ทางร่างกาย พบว่าร้อยละ 38.8 ของนักเรียนพอใจกับภาพลักษณ์ทางร่างกายและร้อยละ 40 ของทั้งหมดต้องการผอมลง การวิเคราะห์องค์ประกอบเชิงสำรวจให้ผลการเลือกบริโภคอาหาร 5 แบบสำหรับการศึกษาในครั้งนี้ดังนี้ สุขภาพและศาสนา, ราคาและความสะดวก, ความสุขสบาย, การควบคุมน้ำหนัก และความคุ้นเคย ในท่ามกลางแบบการเลือกบริโภคอาหารเหล่านั้น นักเรียนให้ความสำคัญมากที่สุดกับสุขภาพและศาสนา (mean = 3.11 ± 0.94) ส่วนกิจกรรมทางกายภาพมีความเกี่ยวข้องเชิงบวกกับการเลือกบริโภคแบบสุขภาพและศาสนา (β = 0.306; p-value = 0.001) และการบริโภคอาหารแบบความควบคุมน้ำหนัก (β = 0.438; p-value < 0.001) นักเรียนผู้ที่เข้าถึงสื่อออนไลน์อย่างถี่มักเป็นไปได้มากที่จะเลือกอาหารของพวกเขาบนพื้นฐานของราคาและความสะดวก (β = 0.056; p-value = 0.010) และความสุขสบาย (β = 0.044; p-value = 0.042). เงินค่าใช้จ่ายของนักเรียนมีความเกี่ยวข้องเชิงบวกกับการเลือกบริโภคอาหารแบบความสุขสบาย (β = 0.018; p-value = 0.003). อย่างไรก็ตามนักเรียนผู้ที่มีความต้องการที่อ้วนขึ้นมักเป็นไปได้ที่จะเลือกเหตุจูงใจในการควบคุมน้ำหนัก (β = -0.297; p-value = 0.031) ซึ่งคล้ายกับความรู้ด้านโภชนาการที่มีความเกี่ยวข้องเชิงลบกับการเลือกบริโภคแบบความคุ้นเคย (β = -0.008; p-value = 0.047) บทสรุป: นักเรียนระดับมัธยมศึกษาตอนปลายให้ความสำคัญกับสุขภาพเวลาเลือกการบริโภคอาหารของพวกเขา นักเรียนที่มีความคล่องแคล่วอย่างมาก พวกเขามักให้ความสำคัญอย่างมากกับการเลือกบริโภคอาหารแบบสุขภาพและศาสนาและเช่นเดียวกับการควบคุมน้ำหนัก สำหรับนักเรียนที่มีความรู้ทางโภชนาการมักเป็นไปได้ที่จะลองอาหารที่แตกต่างจากเดิม แม้ว่านักเรียนผู้ที่มีความต้องการที่อ้วนขึ้นให้ความสำคัญน้อยลงกับหตุจูงใจในการควบคุมน้ำหนัก สำหรับการเข้าถึงสื่อออนไลน์และเงินค่าใช้จ่ายได้กำหนดบทบาทเกี่ยวกับการเลือกบริโภคอาหารแบบความสุขสบาย บุคลากรการผลิตอาหารถูกคาดว่าจะเพิ่มการผลิตอาหารที่มีสารอาหารเพิ่มขึ้น

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Syarifah Aqilah : Factors associated with food choice among high school students in Depok, Indonesia. Advisor: ANUCHIT PHANUMARTWIWATH, Ph.D. Co-advisor: Asst. Prof. NUTTA TANEEPANICHSKUL, Ph.D.

Background: Well-being in adulthood are originated from diet behaviour during adolescence. Recently, hurry-up lifestyle of adolescents leads to unusual food choice and results in overnutrition issues. So, the food choice is studied in order to improve the nutritional status of adolescents. *Objectives:* To explore food choice among high school students in Depok, Indonesia and identify its associated factors. *Methods:* A cross-sectional study, using online questionnaires through instant messaging, is conducted from April to May 2020. Food choice is observed through Food Choice Questionnaire (FCQ) and analysed using exploratory factor analysis (EFA). The questionnaires in this study were tested for validity and reliability. To examine the correlation between factors and food choice, a multiple linear regression is used. *Results:* Questionnaire responses from 433 high school students were collected. The response rate in this study is about 89.6% from all recorded responses (483 students) that is sorted by following inclusion criteria. According to characteristics of the respondents, it was found that mean of students' age were 16 ± 0.91 years old. In nutritional status, it showed that overweight and obese students (z-score > 1 SD) were 14.1%. As for body image perception, only 38.8% students satisfied with their body image and 40% of them were wishing to be thinner. The EFA resulted five food choices in this study namely Health and religion, Price and convenience, Comfort, Weight control, and Familiarity. Among those food choices, students placed Health and religion as the most important one (mean= 3.11 ± 0.94). Physical activity was positively associated with Health and religion food choice ($\beta = 0.306$; *p*-value = 0.001) and Weight control food choice ($\beta = 0.438$; *p*-value < 0.001). Students who frequently accessed the medias, were more likely to choose their food based on price and convenience ($\beta = 0.056$; *p*-value = 0.010) and comfort value ($\beta = 0.044$; *p*-value = 0.042). Stipend given to the students was also positively associated with Comfort food choice ($\beta = 0.018$; *p*-value = 0.003). However, students who wishing to be fatter were less likely to consider weight control motive on their food choice ($\beta = -0.297$; *p*-value = 0.031). It was similar with nutrition knowledge that inversely associated with Familiarity food choice ($\beta = -0.008$; *p*-value = 0.047). *Conclusion:* High school students emphasised on their health when choosing their foods. The more active the students, the more they put importance on Health and religion as well as Weight control food choices. Also, knowledgeable students in nutrition were more likely to try different foods. Even so, those who were wishing to be fatter, put less importance on weight control motive. As media access and stipend play roles on comfort food choice, food production personnel are expected to enhance those food with more nutrient.

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Field of Study:	Public Health	Student's Signature ....
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		Co-advisor's Signature ....

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INTRODUCTION

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Health status throughout the life cycle is determined by nutritional status on the previous phase of one particular life cycle (Brown et al., 2011). For achieving the recommended nutritional status, it is essential to fulfill daily nutrition needs accordingly. Adolescence is a transition phase to reach adulthood. It is also a window of opportunity to reach healthy adulthood. However, adolescents face more overnutrition around the globe nowadays.

In 2016, Polynesia and Micronesia had 25.4 % prevalence of overnutrition in female adolescents and 22.4 % prevalence of overnutrition in male adolescents. Latin America and The Caribbean had the prevalence of overnutrition in adolescents 22.9 % in 2017, including male and female. With the same study, Europe and Central Asia were having 21.8 % prevalence of overnutrition in adolescents all over male and female (Benedict, Schmale, & Namaste, 2018).

In Indonesia, based on the latest National Health Survey, there was an increase on overnutrition prevalence in adolescents. In 2013, nationally, the prevalence was 7.3 % and increased to 13.5 % in 2018. Jakarta Special Capital City Region not only had higher number than average but also the most prevalent on overnutrition throughout Indonesia. It reached 21.1% in 2018 from around 12% in 2013. West Java Province as Jakarta's neighboring area was included as a high prevalence and had an increase in this prevalence as well. In-line with Jakarta, overnutrition in West Java has always been higher than national prevalence, which was 7.6 % in 2013, and increased to 15.4 % in 2018 (Badan Penelitian dan Pengembangan Masyarakat, 2013, 2018). Within West Java Province, Depok City is an area where directly connected with Jakarta. It also had the highest prevalence in adolescent overnutrition which was 20.8 % in 2017 compared to the other twenty-seven cities and residences in West Java Province.

Figure 1. (a) Map of Indonesia, (b) highlight on Depok City [red] within West Java Province [bright yellow], (c) highlight on Jakarta and surrounding area where major development takes place including Depok City.

Overnutrition are caused by unhealthy diet and it may increase the risk for non-communicable diseases such as type-2 diabetes, and cardiovascular diseases (*Preventive Nutrition, the Comprehensive Guide for Health Professionals.*, 2005). During adolescence stage, a big change in nutrition needs occurs due to biological development compared to a childhood. They will require more energies by consuming

a large portion of foods than children. Besides, psychological state tends to have more role on their actions, including food-related practice. Peer acceptance, for instance, may change their usual behavior to fit-in in any particular group (Brown et al., 2011). It leads them to spend more time together with friends than their family. Meals skipping and more snacking are their ways to be able to allocate their time interact each other. Moreover, snacks that they choose tend to be greasy food and empty foods which contain high contents of fat and carbohydrate (Wardlaw & Hampl, 2007). These kinds of foods can only fulfill energy needs and leads to overnutrition, by getting either overweight or obese.

Dealing with adolescents requires tricky thoughts. It is recommended that health practitioners need to understand behavior among adolescents. For example, acknowledge snacking as a common thing for adolescent. Health practitioners should attach adolescents to improve their food choices rather than forcefully ask them to stop snacking.

Food choice is also the prospects for future changes in behaviors and attitudes to meet dietary recommendations (*Improving America's Diet and Health: From Recommendations to Action*, 1991). Through food choice understanding, health practitioners can reverse unusual or miss-dietary practice which often occurs in adolescents and leads them to healthy lifestyle. This up-stream approach is to be expected to help on designing appropriate intervention for adolescents. Intervention by which aiming more sustainability in behavioral change will be better than pushing them to change their dietary practice only. It is because food choice allows health practitioners to deeply explore adolescents' thought and value towards food.

Based on above conditions, the study of food choice in adolescents is considered necessarily. A few studies have been conducted in Indonesia, but they did not cover neither West Java Province nor Depok City. This study will explain food choice among adolescent in Depok including nutrition-related factors that may be influent their food choice.

1.2 Research Question

1. How is food choice among high school students in Depok?

2. Are general characteristics, dietary habit, physical activity, nutritional status, nutrition knowledge, body image perception, and media engagement associated with food choice among high school students in Depok?

1.3 Research Objective

1. To explore food choice among high school students in Depok using exploratory factor analysis (EFA),

2. To identify factors associated with food choice (general characteristics, dietary habit, physical activity, nutritional status, nutrition knowledge, body image perception, and media engagement) among high school students in Depok, Indonesia.

1.4 Research Hypothesis

General characteristics, dietary habit, physical activity, nutritional status, nutrition knowledge, body image perception, and media engagement are associated with food choice among high school students in Depok, Indonesia.

1.5 Operational Definitions

Table 1. Operational definitions

No	Variables	Operational Definition
1	Food choice	Motives on selection and consumption of food and beverages.
2	Sex	Male or female.
3	Age	Number of years from the last birthday.
4	Parent's education	Parents' level of education which is categorized as high-educated for parents who finished at least diploma/higher degree or less-educated for parents who finished high school/lower than high school.
5	Stipend	Amount of money given to students per week.
6	Dietary Habit	Breakfast and meal frequencies.
7	Physical activity	Physical activity status as physically active or physically inactive based on PAQ-A score.
8	Nutritional status	Undernutrition, normal, overweight, or obese based on z-score in BMI for age indicators.

No	Variables	Operational Definition
9	Nutrition knowledge	Knowledge regarding foods, nutrients, dietary guideline, and food effects on health. It is categorized as "good" if the score is more than and equal to 80 or "not good" if the score is less than 80.
10	Body image perception	Perception and thoughts (feeling positive or negative or both) of physical self. It is categorized as satisfied, wishing to be thinner, or wishing to be fatter.
11	Media Engagement	Engagement to food-related media which is presented in term of media access frequency, key informant, and participation to food-related event.

1.6 Scope of the Study

This research focuses on food choices among senior high school students. General characteristics, dietary habit, physical activity, nutritional status, nutrition knowledge, body image perception, and media engagement of the students are obtained and examined during the study.

1.7 Conceptual Framework
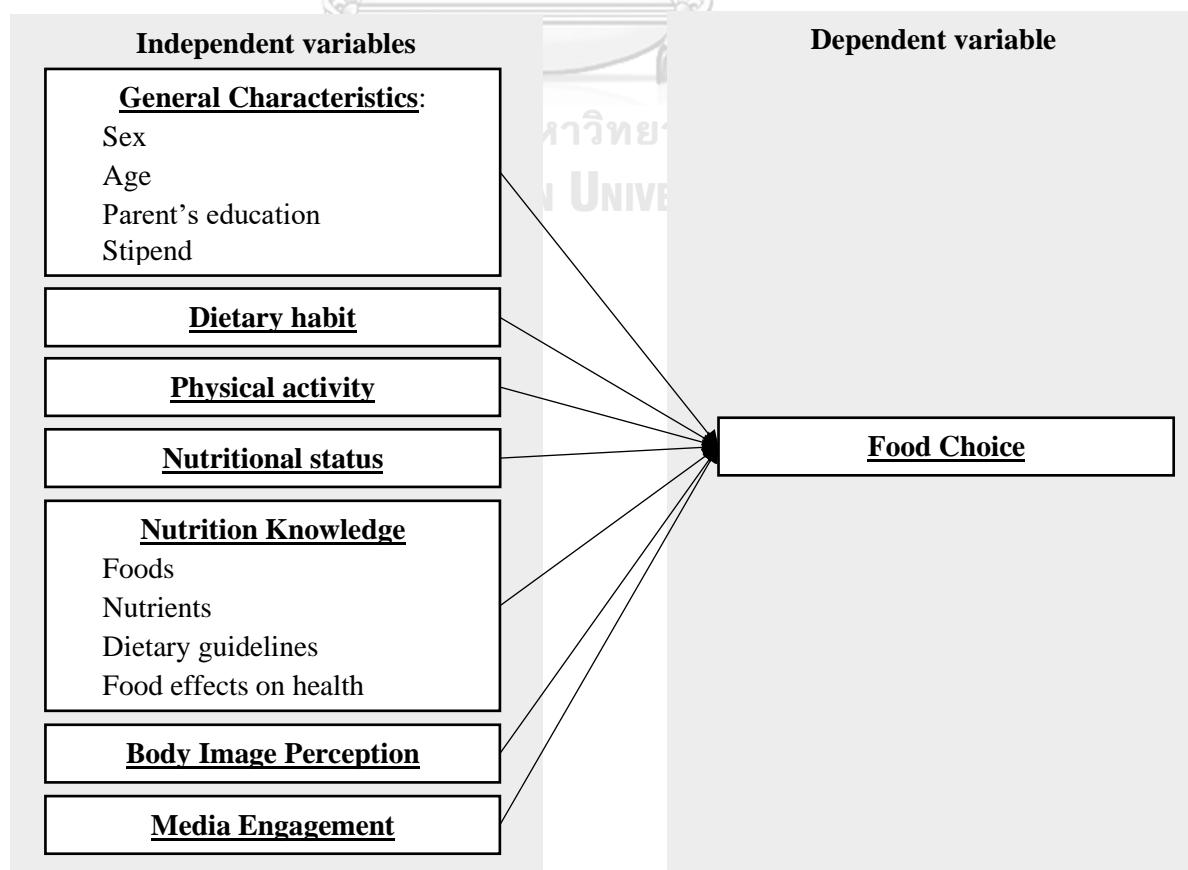
CHAPTER II
LITERATURE REVIEW

2.1   Food Choice

Food choice or some discuss it as food selection is a study of those factors that influence choices (Meiselman & Bell, 2003). Technically, R. Sepherd & M. Raats (*The psychology of food choice*, 2006) described that food choice covers selection and consumption of foods and beverages with putting into account what, how, when, where, and with whom people eat. The aspects of foods and eating behavior also take a part on food choice. Food choice itself is essential because it can either support our health or lead to many chronic diseases. Everyday's choices may be convenient or harm our body only a little. Those benefits and consequences become a major problem in a long-term period (Whitney & Rolfes, 2008).

Meiselman and Bell (2003) differ food choice with food preference where in preference people put some evaluative expression toward their food. It often comes with hedonic scale, like and dislike, and some with frequencies as well. On the other hand, food choice is a complex structure within physiology, psychology, economics, and consumer behavior. These disciplines construct food choice through subscales associations amongst and under each discipline.

People seek for food primarily due to biological hunger and thirsty mechanism. Then, the process by which regulating food and water intake is established. It is likely to be an energy source and directs people away from harmful substances (Rozin, 2007). By consuming food, they expect to have beneficiary in health. Fulfilling any micro or macronutrient deficiencies, keeping away from sickness and diseases, managing their body weight and fitness and having a good appearance (Whitney & Rolfes, 2008). Food safety is also taking part in food choice. People tend to reject food with contamination by biological, physical, or chemical substances. Even many may choose organic foods considering as a safer food, it is not always better than ordinary foods. Food handling from harvesting until serving on the table becomes the key in this situation (Marcus, 2013).

Likely to eat that influence by mood is also undoubtedly. Female often feels guilt when they realize too much indulgence in previous meal or even current's first part of

a meals. It tends to affect their food choice and intake afterward. These situations commonly called as compensation (Rozin, 2007). Other study on specific nutrient intake found both direction between food and mood. It was either more intake affected mood or mood state affected more or least intake of nutrients (Rogers, 2001).

Expectations as mentioned above will only become choices when the foods are available. If it is not, there is only the choices of whether to eat or not (Rozin, 2007). Food availability stands with convenience in access and cost. Our current living style forces us to be fast and efficient, eating out might be preferable. Food manufacturer and restaurant respond it very well by providing both grab-to-eat and family food. Many convenience stores also become destinated places to get food. Ready-to-eat or easy-to-prepare and low-cost foods are most attentive points for the consumers. However, emphasis on convenience may affect person's nutrient needs fulfilment (Marcus, 2013; Whitney & Rolfes, 2008). Fast foods indeed are cheap, handy, and tasty, but are greasy inside. Besides, complete food becomes more expensive considering the steps to process food and food ingredients. In urban area, people have to pay more to get some local ingredients. The transportation causes a cost for the foods as well. The study conducted by Lusk (2019) showed that income can detect preference reversal on food. Interestingly, persons who commit preference reversals are less likely to rate price and are more likely to rate variety as important food values.

Another key factor regarding food choice is the person-food interface. Generally, it is about sensory properties of the food. These include taste, smell, and texture or 'flavor' and also visual and auditory qualities. It plays a major role when people select their food, especially its taste (Rozin, 2007; Whitney & Rolfes, 2008). The two-widely shared preference are the sweetness of sugar and the saltiness of salt. Other common preference are high-fat or high-oil and spicy food.

During childhood, parent's food preference and practice play a major role on influencing child's food likes and dislikes. It is because children still cannot process any information to make the choices. Their selection might also be due to culture and religion which sacredly write, and rule which foods are religiously correct and/or safe.

These histories or experiences are retained lifelong and is a strong contributor to food acceptance and food selection. Familiar foods tend to be chosen for comfort and safe, especially when people are sick in order to help them to feel better. It is also because it brings memories of family, tradition, and celebration (Brown et al., 2011; Marcus, 2013; Meiselman & Bell, 2003).

2.2   Adolescence

Adolescence is a window period in approaching an adulthood. It lies between age eleven to twenty-one years old. Some categorizes adolescents into several phase, early adolescent for age eleven to fourteen years old, middle adolescent for age fifteen to seven-teen years old, and late adolescent for age eight-teen to twenty-one years old.

It is the second rapid growth period in humankind. Both physical and mental developments occur during this phase. Puberty changes the physical condition, whilst cognitive, emotional, and social skills change their personality. These are the reasons for a dramatic change in nutrition needs as well. Adolescents need a lot more macro- and micronutrient intake to support these developments compared to the first rapid growth period in children.

Keep feelings hungry or become hungry in a shorter time interval are natural body response during adolescence to fulfill the needs. Unfortunately, adolescents have busy lifestyle caused by school assignments, extracurricular activities, part-time jobs, taking care of other family members and so on. These trigger them to miss a proper meal, the food, or even the chance to eat. On the other hand, adolescence is a phase for a child trying to be independent and choose friend over their family. Gathering with friends counts some value among their social interaction. Yet through this moment, adolescents influence each other including dietary practice. For example, they tend to choose foods containing high-sugar, sodium, and fat while they are relatively low chance in vitamins and minerals (Brown et al., 2011; Wardlaw & Hampl, 2007). A study also proved positive association between perceived social acceptability and consumption of less healthy foods (Tarabashkina, Quester, & Crouch, 2016). The same result applied for association between appealing taste and consumption of less healthy foods as well.

Female adolescents are more vulnerable to experience deficiencies due to dramatic biological and psychological changes. Biological development as growth spurt and menarche increases nutrition needs, whilst psychological development may change their dietary habit into less food consumption. This condition is critical especially for them who plan to or pregnant.

However, adolescence is also an opportunity to reach healthy adulthood. In the later phase, cognitive capabilities mainly firmed and assisted them to start set up their future and understanding any possible consequences that associated with their current behavior. Less concern about surrounding acceptance and more independence from family support caused their personal choice. These reasons become a standing point for this study to be specific on high school students who are adolescents in a later phase and usually aged around sixteen to eight-teen years old.

2.3 Nutritional Status

Nutritional status for individual requires four assessments to be concluded. Those are clinical/physical, dietary, anthropometrics, and biochemical assessment. Each of these methods involves collecting data in various ways and interpreting each finding in relation to the others to create a total picture. A result from single nutritional assessment method cannot conclude individual nutritional status. For example, people who have normal height, weight, and iron status can only consider as "well-nourished"

However, individual measures of body size (e.g. height, weight, percent body fat, bone density, and head and waist circumferences) or anthropometrics are useful in the assessment of nutritional status. It indicates trends in a person's overall nutrition status, but they provide little information about specific nutrients. Instead, measurements out of line with expectations may reveal such problems as growth failure in children, wasting or swelling of body tissues in adults, and obesity. This is indeed beneficial in term of economics and feasibility, but it is difficult to assure the result. Anthropometric measurements are frequently performed and recorded incorrectly in clinical practice. Each measurement requires use of standard techniques and calibrated instruments by trained personnel. Hence, health professionals in coordination with government tackle this situation by providing training and

workshop for anthropometrics measurement (Brown et al., 2011; Wardlaw & Hampl, 2007).

Height and weight measurement will result weight status. It is generally used for indicating nutritional status in adolescent as well as essential for monitoring overweight and obese. The weight status should be assessed by calculating body mass index (BMI). BMI is calculated by dividing a person's weight (kg) by their square height (m). BMI values are compared to age- and gender-appropriate percentiles to determine the appropriateness of the individual's weight for height. The table as shown below is weight status categories according to BMI values for adolescent:

Table 2. Weight Status on Children Age 5 - 18 years old

No	Weight Status	BMI Value
1	Severely thin	< -3 SD
2	Thin	-3 SD to < -2 SD
3	Normal	-2 SD to 1 SD
4	Overweight	> 1 SD to 2 SD
5	Obese	> 2 SD

source: Indonesia Anthropometric Nutritional Assessment Standard for Children (2011)

In Indonesia, the prevalence of overweight and obese adolescents rose 6.2%, reaching 13.5%, between 2013 and 2018. The prevalence of underweight adolescents, on the other hand, decreased from 9.4% in 2013 to 8.1% in 2018 (Badan Penelitian dan Pengembangan Masyarakat, 2013, 2018). Underweight is referred to the combination between thin and severely thin weight status.

The study that reported by Contento, Basch, and Zybert (2003) found an association between BMI of mothers with food choice for their children. Considering health in food choice was more likely among mothers with the lowest BMIs and least likely among mothers with the highest BMIs. Meanwhile, the result was in contrast with taste toward children by a gender. The lowest BMIs mother consider taste for girls' food choice but not boys' and the highest BMIs mother consider taste for boys' food choice but not girls'

2.4 Nutritional Knowledge

Nutritional knowledge is the knowledge about foods, nutrients, dietary guidelines and the effects of food on health (Brown et al., 2011). The understanding of nutrition helps people make sensible food selections more often (Whitney & Rolfes, 2008).

In rich-nutritional knowledge population, students majoring in nutrition and dietetics had better food choice and adequate nutritional intake among college students (Ilich, Vollono, & Brownbill, 1999). For general population, (Tarabashkina et al., 2016) found that parents with higher nutritional knowledge had children whom they tended to consume unhealthy foods in low frequency. They also explained that higher nutritional knowledge weakened the relationship between product evaluations and consumption in children. The study among college students found the higher level of nutrition knowledge and the higher dietary attitudes (Bibiloni, Pich, Pons, & Tur, 2013). On specific nutrient, nutrition knowledge was negatively correlated with fat and cholesterol intake. Students who consumed more than 35 % calories from fat or more than 300 mg of cholesterol a day had lower mean nutrition scores than those with lower fat or cholesterol intake (Yahia, Brown, Rapley, & Chung, 2016).

2.5 Physical Activity

According to World Health Organization (WHO), physical activity is body movements by which force muscle to result energy expenditure. It covers any activities during work, play, do household chores, travel, and recreation. Exercise, on the other hand, is part of physical activity that underlined as structured, repetitive, planned, and aimed to maintain or achieve particular body fitness. Meanwhile, a sport is rather similar to exercise but also aiming for achievement in term of competition. Hence, the sport has specific rule and condition to meet (Health Promotion Directorate, 2018). These activities with moderate and vigorous intensity have clearly proven on health benefit.

The regular physical activity is an effective primary and secondary preventative strategy against at least 25 chronic medical conditions. It reduces risks typically in the 20–30% range (Rhodes, Janssen, Bredin, Warburton, & Bauman, 2017). A systematic review study concluded that moderate- to vigorous-intensity physical activity was

most consistently associated with desirable health indicators for school-aged children and youth (Saunders et al., 2016).

The government of Indonesia adopt WHO recommendation for physical activity on adolescent. It is doing moderate to vigorous activity at least sixty minutes in accumulation throughout the day. Adolescents are also encouraged to do activities that strengthen their muscle and bone at least three times per week. The government suggests school to have thirty-minutes physical activity before class or health education session regarding physical activity for the students during school-hour every day.

A study by Lowry et al. (2000) showed that female and male students who reported doing exercise to lose or maintain weight were more likely to eat more than equal to 5 servings/day of fruits and vegetables and less than equal to 2 servings/day of high-fat foods.

2.6 Body Image Perception

Body image, primarily, is beyond than how person assesses their body shape. It is a comprehensive issue including person's thought, feeling, and attitude towards their body. Thought or perception is usually measured by confirming the accuracy of body size in estimation and actual size. Feeling and attitude links each other by satisfaction (body evaluation), affection (feeling toward body), cognition (investment/belief in appearance), and behavior (reward or restraint).

Despite above description, body image is often defined and measured varyingly in accordance with any background and aim of the study that are carried out by researchers (Grogan, 2017). This study will focus on body image perception. It will only use the confirmation to link with other aspect, food choice.

In adolescents, body image issues are still of concern, especially among males, who are late to mature, and females. It leads to poor body image and eating disturbance (Brown et al., 2011). Bibiloni et al. (2013) said that adolescents who were wishing to be thinner, reported lower consumption of several food groups than others. Also, the study conducted by Radwan et al. (2019) found that female students who wished to be thinner follow a diet, but not for male. The other study, interestingly, found that adolescents who perceived themselves as thin consumed unhealthier foods, where

those who perceived themselves as fit and overweight ate healthier foods (Gaylis, Levy, & Hong, 2019).

2.7 Media Engagement

Nowadays' lifestyle cannot be separated from the influence of media. It is also applied to food choice. Book, newspaper, radio, magazine, television, the internet, and social media to some extent direct food choice on people. Even food manufacturers, restaurants, supermarket or others which food as their product, invest and rely so much on utilizing media to persuade consumer purchasing their goods. Not only content that they are concerned with but also market target. For example, they attract mother for the sale of family food or children for snacks and beverages.

The study by Scully et al. (2012) indicated that greater exposure to commercial television, print/transport/school food marketing, and digital food marketing were all independently associated with students' food choices. An experimental study on televised food commercial found that children placed significantly more importance on taste after watching food commercials compared with nonfood commercials (Bruce et al., 2016). The other study showed that internet and social networks use were related to body image and eating behaviors positively associated with inappropriate eating attitudes/behaviors (Kaewpradub, Kiatrungrit, Hongsanguansri, & Pavasuthipaisit, 2017).

2.8 Related Studies

Food choice is a multifaceted study. Therefore, it has been used for many studies exploring relations between food, behavior, stress, consumption / intake, mood, hedonistic value, socio-economics, product development, ethical concern, health outcome, physical activity, and so on (Cunha, Cabral, Moura, & de Almeida, 2018). Although some studies made some adaptation in the questionnaire fitting their goals, Food Choice Questionnaire (FCQ) was initially developed by Steptoe, Pollard, and Wardle (1995).

Share and Stewart-Knox (2012a) has done the food choice study among Irish adolescents using a modified version of the FCQ. The study resulted five food choice motives which labeled as health, mood, price/convenience, religion, and animal

rights. Animal rights has the highest mean value compare to the other motives. Younger adolescents were more likely than the older ones getting motivated by animal rights when choosing their food. It also applied in female who were more likely motivated by animal rights than male on their food choice. Animal rights was previously suggested as an additional subscale by Marjaana Lindeman and Väänänen (2000) to involve vegetarianism and ethical in food choice. Not only animal rights, but also religion subscale from Marjaana Lindeman and Väänänen (2000) were included in this study. Although it was the least importance value, male and younger adolescents were found more attentive on religion motive than female and older adolescents. On the other hand, female and younger adolescent value more on health than male and older adolescents respectively. Health motive in this study was loaded health, weight control, and natural subscales from the original FCQ. This study also suggested further research to follow accordingly since adolescents saw health as one broad matter compared with adults who distinguished health into some specific matters.

Another food choice study by Canales and Hernández (2016) conducted among middle and high school students in Spain. From nine original subscales, the study revealed a new six-food choice motives which were health and natural, price, sensory appeal, weight control, ethical concern, and familiarity. They eliminated mood and convenience from the original subscales considering irrelevant for adolescents. Among those new six food choice motives, sensory of the foods was the most important for adolescent. Female students placed more importance on sensory appeal than male students. It was similar with private school students placing more importance on sensory while compared with public school students. "Health and natural" motive was the third place after price. Both private and public high school students value health and natural motive as equally important. Ethical concern, on the other hand, was the least important in this study. Interestingly, public school students valued ethical concern more than private school students.

In Indonesia, Maulida, Nanishi, Green, Shibanuma, and Jimba (2016) found five motives of food choice among middle school students. There were comfort, convenience and price, health, lifestyle, and religion motives. But they had to

eliminate lifestyle and religion due to low value on reliability. Health motive had the highest value of importance among these motives. Unusual finding explained that instead of female, male students were the ones who value more on health while choosing the foods. Also, students from more affluent family were less likely to choose their food based on health motive. Yet, less affluent students placed more importance on convenience and price on their food choice.

CHAPTER III
RESEARCH METHODOLOGY

3.1   Study Design

A cross-sectional analytical study design is used in this study. The study conducted from April until May 2020 through an online questionnaire. Food choice of the students are obtained and determined without considering whether food choice are the exposures or the outcome of all possible related factors in this study.

3.2   Study Population and Setting

This research studies on senior high school student in Depok City, West Java, Indonesia. Based on the latest data (2017), West Java has high prevalence on overweight in adolescent compared to the overall cities in Indonesia. Moreover, Depok poses high prevalent overweight in adolescent among cities in West Java, 20.8%.

3.2.1   Inclusion criteria

High school students who participate in this study complied criteria as follow:

    1) A student from senior high school in Depok city,

    2) Had access to the internet,

    3) Agreed to participate.

3.2.2   Exclusion criteria

    1) Students who gave incomplete answer.

3.3   Sampling and Sample Size

As this research has dependent variable with continuous data, sample size calculation applies with One Mean Estimation formula. It is assumed that on 95%CI, $\mu = \bar{x} \pm d$,

    μ = true population's mean

    $\bar{x}$ = expected mean

    d = margin of error of estimating mean

So, sample size approximation formula:

$$n = [Z_{\alpha/2}\, SD\, /\, d]^2$$

$Z_{\alpha/2}$ = 1.96 (α = .05)

SD = 0.31 (Maulida et al., 2016)

d = .05

n = 178

Accordingly, minimum sample in this study is 178 participants.

3.4 Sampling Technique

This study uses snowball sampling technique. A unique link to access the questionnaire is firstly sent to potential high school students in Depok. After filling out the questionnaire, the student is encouraged to share the link to the other students. Due to a low response (2%) on the first week of data collection, not only students, but also general population are involved for link distribution between mid of April until mid of May 2020. Therefore, this sampling is considered as a prompt way to overcome uncertain condition that is caused by Corona Virus Disease 2019 (COVID-19) outbreak and where meeting people is strongly not recommended.

At the end of the study period, 483 responses are recorded in the system. However, researcher has to remove 50 responses due to ineligible participants (outer Depok students) and/or incomplete answers. Finally, the study processes 433 responses from high school students in Depok or 89.6% of all submitted responses. Appropriateness for running factor analysis also takes part while deciding the final number of participants (Barbara G. Tabachnick & Fidell, 2007).

3.5 Research Instruments

3.5.1 Food Choice

Food choice of the students is obtained using Food Choice Questionnaire (FCQ) as studied by Maulida et al. (2016). It contains 33 questions covering nine subscales: health, mood, convenience, sensory appeal, natural content, price, weight control, familiarity, and religion. These subscales are originated from the initial study which was conducted by Steptoe et al. (1995) and combined with further investigation that conducted by Marjaana Lindeman and Väänänen (2000).

The subscales under the FCQ can be used independently following the objectives of a research (Marjaana Lindeman & Väänänen, 2000). This present study, therefore, uses only the 8-subscales from the original FCQ (Steptoe et al., 1995) considering items under ethical concern subscale that mainly related to political issues as irrelevant for high school students in Depok, Indonesia. Religion subscale which was introduced as a further study on ethical concern by Marjaana Lindeman and Väänänen (2000) is used instead. One particular item on convenience subscale in the original FCQ is also omitted in this study. It is stated "can be cooked very simply" whereas high school students in Depok are not likely to cook when preparing their food. Details on items-construct in the FCQs are available on the Appendix page 47.

Internal consistency of the FCQ from the original study was in the range of 0.70 – 0.87, whilst correlation between each subscale were around 0.59. The study by Maulida et al. (2016) resulted three subscales for analysis with coefficient of α value as 0.79, 0.76, and 0.72.

Factor analysis is performed to discover new subscales respectively for this study. Four Likert's scale is used in this questionnaire to rate the food choice. They are "not important at all" scored as 1, "a little important" scored as 2, "important" scored as 3, and "very important" scored as 4. Score is summed up and averaged for each subscale. Consequently, there is a mean score for each food choice.

3.5.2 General Characteristics

Variables which are under general characteristics as sex, age, parent's education, and stipend are obtained on general characteristics section's title. Sex, parent's education, and stipend is explicitly answered as its question. Then, parent's education is categorized as "high-educated" for parents who finished at least diploma or higher degree and "less-educated" for parents who finished high school or lower than high school. Stipend is an open answer question and is in Indonesia Rupiah (IDR). Its mean, minimum, and maximum value are presented in descriptive part, whilst its value is used for regression analysis.

Age is obtained from student's date of birth and is calculated based on the last birthday (in years) for the assumption test. Age is also used to calculate nutritional status, but it is presented in months and be paired with student's BMI.

3.5.3 Dietary Habit

Dietary habit is obtained through two questions: 1) frequency on having meals per day, and 2) frequency on having breakfast per week. Summarized data for students who had 7-times breakfast a week and 3-times meal a day are included for regression analysis.

3.5.4 Physical Activity

Physical activity is obtained using Physical Activity Questionnaire – Adolescent (PAQ-A) which was developed by Kowalski, Crocker, and Donen (2004). According to a study conducted by Martinez-Gomez et al. (2009), its reliability test showed ICC = 0.71 for the final score of PAQ-A. Internal consistency was α = 0.65 in the first self-report, 0.67 for the retest in 82 participants, and 0.74 for retest in 232 participants. The PAQ-A was also moderately correlated with total PA (rho = 0.39) and MVPA (rho= 0.34). The questionnaire consists of nine questions with seven days recall of activities. Each question for number one to eight have its components with five points scale. The higher score means the higher physically active. The mean of every eight questions is calculated and be used to calculate the mean of overall physical activity. Students are considered as "physically active" if the mean of overall physical activity is more than 2.75 and "physically inactive" if the mean of overall physical activity is less than and equal to 2.75 (Benítez-Porres, Alvero-Cruz, Sardinha, López-Fernández, & Carnero, 2016).

3.5.5 Nutritional Status

Nutritional status categories are referred to Indonesia Anthropometric Nutritional Assessment Standard for Children age 5 to 18 years old (the Appendix page 70). It is recategorized into four groups which are "underweight" for adolescent with BMI value less than -2 SD, "normal" for adolescent with BMI value between -2 SD and 1 SD, "overweight" for adolescent with BMI

value between more than 1 SD and 2 SD, and "obese" for adolescent with BMI value greater than 2 SD.

3.5.6 Nutrition Knowledge

Nutrition knowledge of the students is examined using General Nutrition Knowledge Questionnaire which was developed through literature review from Kliemann, Wardle, Johnson, and Croker (2016) and Indonesia's dietary guideline. It consists of twenty-five questions regarding balance foods, nutrients, dietary guidelines and food effects on health. A correct answer of each question is scored as 1 and wrong answer is scored as 0.

Total score is summed up and multiplied by 4 to reach 100 as a total score. Students are considered as having "good" nutrition knowledge if they have score more than and equal to 80 and having "not good" nutrition knowledge if the score is less than 80 (Baliwati, Khomsan, & Dwiriani, 2004).

3.5.7 Body Image Perception

Body image perception of the students is assessed using Stunkard's assessment scale that are modified by Erdenebileg, Park, and Chang (2018). It contains two sets of five silhouette drawings which separate for male and female. One set of drawing is used to assess "current body image" and the other one is used to assess "ideal body image". In each set, figures and numbers are displayed. Figure 1 means "skinny", figure 2 means "thin", figure 3 means "normal", figure 4 means "overweight", and figure 5 means "obese". Figures are attached on the Appendix page 65.

Students are encouraged to circle one figure in each set of drawing. Thus, body image perception is calculated by "current body image" minus "ideal body image". The result is categorized as "satisfied" if the score is zero, "wishing to be thinner" if the score is more than zero, and "wishing to be fatter" if the score is less than zero.

3.5.8 Media Engagement

Media engagement data is obtained through five questions. The first question is types of media that students ever accessed, and they are related to food. The

second one is frequency for accessing those media in a week. The third one is regarding key provider of the food-related information that student access. They are researchers, celebrities, and health workers. The fourth and fifth ones are regarding students' participation on food-related event such as joining in a club (intense) and participating in food bazars, cooking demo, culinary exhibition, etc (occasional). Engagement is presented as frequency on accessing the medias, the percentage of trusted key provider, and never or ever participated in food-related activity.

3.6   Validity Test

Forward and backward translation is applied for this study as questionnaires are standardized in English. It requires two independent translators to do forward translation from English into Bahasa. Any differences are discussed and resolved within those translators or involved other bilingual translator who did not participate in previous translation process. For backward translation from Bahasa into original language (English), the same principles is applied with other independent translators or never participate in all translation process regarding this study. At least one of these translators is an expert in nutrition or public health major (Tsang, Royse, & Terkawi, 2017).

Forward and backward translation is done for the Physical Activity Questionnaire – Adolescent (PAQ-A) and Stunkard's assessment scale for body image perception. Forward and backward translation is made by different persons having different occupations. Both nutrition and public health sector (lecturers) and general sector (a teacher) are involved in this forward and backward translation. Also, face validity has previously done when deciding to use Stunkard's assessment scale that was modified by Erdenebileg et al. (2018) in this study.

The validity for general characteristics, nutrition knowledge, and media engagement questionnaires are measured by Item-Objective Congruence (IOC) scoring. Three experts who participated are a lecturer, a researcher, and a nutrition professional. Questionnaire items which scored less than 0.5 are removed.

3.7   Reliability Test

All the questionnaires in this study were tested by 30 high-school students for evaluating the reliability. Physical Activity Questionnaire – Adolescent (PAQ-A) that forward-translated to Bahasa had Cronbach's α value of 0.755 which was considered as reliable. Hence, Physical Activity Questionnaire – Adolescent (PAQ-A) was used in this study.

Nutrition knowledge questionnaire initially consisted of 35 questions. It had Cronbach's α value of 0.516 which considered as poorly reliable. Some item questions were removed in order to reach a standard value (0.7) of the Cronbach's α. Only 23 questions from the total resulted in the formation of A Cronbach's α value of 0.706. However, 25 questions of nutritional knowledge questionnaires showing a Cronbach's α value of 0.684 were acceptable and was used in this study (Taber, 2018).

3.8   Data collection

Data collection run from mid of April until mid of May 2020. A unique link to access the questionnaires is spread to high school students in Depok via instant messaging mobile application. Through this link bit.ly/foodchoice-highschools, informed consent is displayed on the first part of the online questionnaires, and became a condition for the respondents in order to continue to the next part of the questionnaires. Only respondents who agree to participate in this study can access the real questionnaires.

Once respondents access the real questionnaires, they are asked to complete their general characteristics including the name of school. The name of school is used to sort the eligibility of the respondents who are high school students in Depok city only. After completing general characteristics information, respondents are asked to complete the other measured variables e.g body image perception, nutrition knowledge, media engagement, and food choice. A unique condition is applied for body image perception questionnaire. Students access the questionaire based on their response on sex column because body image perception is specifically measured for male and female. The overall time for completing all the questionnaires is about 10 to 15 minutes.

3.9 Ethical consideration

This study is approved by Institutional Review Board Fakultas Kesehatan Masyarakat Universitas Muhammadiyah Jakarta on April 17th, 2020. The description is under Ethical Approval No. 10.003.B/KEPK-FKMUMJ/TV/2020 and is enclosed in the appendix.

3.10 Data Analysis Methods

The significant level of this study is set at p-value = 0.05. Data analysis process uses software packages (SPSS) version 22.

Exploratory Factor Analysis (EFA) is performed in this study for creating new subscales which represent food choice in high school students. Five subscales are created from the nine subscales of thirty-three FCQ's item. In the process, these new subscales are extracted with Principle Component Analysis (PCA) method, then rotated with Promax rotation approach under an Oblique rotation technique (figure 3). The new subscales are also labeled accordingly from items construct.
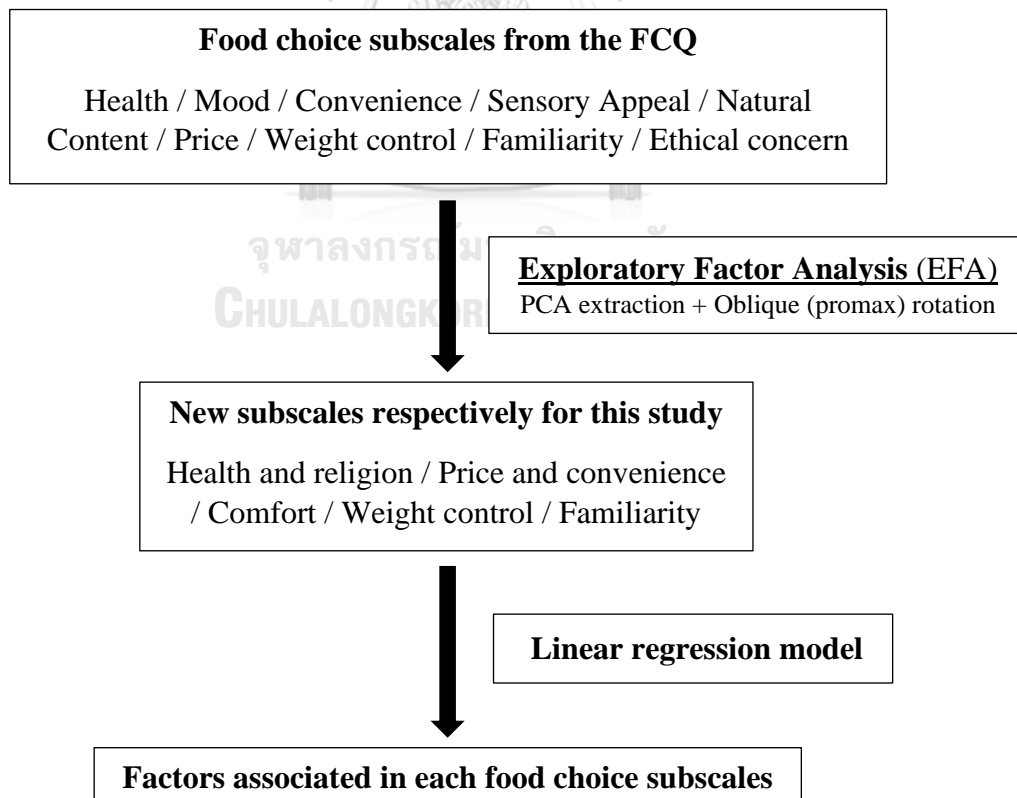

Figure 3. Data analysis process

Descriptive statistics is performed for describing variables distribution among participants. The results are showed as number, percentage, mean, standard deviations, minimum, and maximum. As for determining association and relation between factors and food choice, multiple linear regression is performed for each new food choice subscales.

CHAPTER IV
RESULT

4.1   Characteristics of respondents

This study recorded 433 responses from both public and private high school students in Depok, Indonesia. In Table 3, it showed that students from public high school were the majority (64%). Most of the students were in the tenth grade (59.8%), whilst the least students were in the twelfth grade (12.5%). Interestingly, students majoring in natural sciences contributed more than a half of responses (57.3%) in this study.

*Table 3. **Characteristics of the respondents (N: 433)***

	n	Percentage
Type of school		
Public school	277	64.0
Private school	156	36.0
Grade		
10th	259	59.8
11th	120	27.7
12th	54	12.5
Major		
Natural science	248	57.3
Non-natural science	185	42.7

Referring to Table 4, the study is dominated by female students (71.4%). Almost half of the students were 16 years old (43.2%), whereas the other were 17 years old (25.6%), 15 years old (20.8%), and 14 years old (0.2%). Parent's education levels followed the operational definition which categorize diploma degree attainment as a start point for high-educated parents. Accordingly, high-educated father was the majority in this study (52.7%), although most of students' mother (56.1%) considered as less-educated. Stipend or allowance of the students were varied, ranging from Rp5.000,00 to Rp500.000,00. On average, parents gave their children about Rp87.600,00 for expenses in a week (approximately USD 6.13).

*Table 4. **General characteristics of the students (N= 433)***

	n	Percentage
Sex		
Male	124	28.6
Female	309	71.4
Age (year)		
14	1	0.2
15	90	20.8
16	187	43.2
17	111	25.6
18	44	10.2
Mother's education		
Less educated	243	56.1
High educated	190	43.9
Fathers 's education		
Less educated	205	47.3
High educated	228	52.7
Stipend (IDR)		
Mean ± SD		87.6K ± 83.1K
Minimum - maximum		5K – 500K

In Table 5, it can be seen that only 51% students had everyday breakfast. Moreover, almost two-third of students (61.2%) had only 2-times meals per day. In fact, it is common for high school students in Depok having full-day school period with additional schedule either for cram school or extracurricular activities. So, meal is considered necessary for them, yet they did not have it.

*Table 5. **Dietary habit of the students (N= 433)***

	n	Percentage
Dietary habit		
Breakfast frequency per week		
0	16	3.7
1	23	5.3
2	25	5.8
3	35	8.1
4	20	4.6
5	74	17.1
6	18	4.2
7	222	51.3
Meal frequency per day		
1	7	1.6
2	265	61.2
3	151	34.9
4	9	2.1
5	1	0.2

*Table 6. **Nutritional status of the students (N= 433)***

	n	Percentage
Nutritional status (BMI for age)		
Underweight (z-score < -2 SD)	36	8.3
Normal (-2 SD ≤ z-score ≤ 1 SD)	336	77.6
Overweight (1 SD < z-score ≤ 2 SD)	47	10.9
Obese (z-score > 2 SD)	14	3.2
z-score, mean ± SD		**-0.30 ± 1.26**
z-score, minimum - maximum		**-4.99 – 3.61**

Nutritional status assessment in this study uses Body Mass Index (BMI) for age criteria. It is because students were children with age range from 5 years old to 19 years old. Accordingly, WHO Anthroplus software was used as suggested by WHO for nutritional survey, and it is a copyright for all non-commercial user. BMI for age criteria followed its z-score or is commonly known as BAZ that was obtained from students' body weight, body height, and age data. Referring to Table 6, overweight students were 10.9% and obese students were 3.2%. These numbers represented overnutrition in students as much as 14.1% whilst most of the students were having a normal nutritional status (77.6%). For the regression analysis process, BAZ value was used instead of nutritional status categories. BAZ itself was ranged from -4.99 to 3.61 and its mean score laid on z-score -0.30 ± 1.26 SD.

*Table 7. **BMI for age towards body image perception (N: 433)***

BMI for age	Body image perception						Total	
	Satisfied		Wishing to be thinner		Wishing to be fatter			
	n	%	n	%	n	%	n	%
Underweight	13	(36.1)	2	(5.6)	21	(58.3)	36	(8.3)
Normal	145	(43.2)	121	(36.0)	70	(20.8)	336	(77.6)
Overweight	8	(17.0)	38	(80.9)	1	(2.1)	47	(10.9)
Obese	2	(14.3)	12	(85.7)	0	(0.0)	14	(3.2)
Total	168	(38.8)	173	(40.0)	92	(21.2)	433	(100.0)

In Table 7, it compared the distribution of students' nutritional status with their body image perception. Highlighting on body image, only 38.8% students satisfied with their body image. Most of the them were wishing to be thinner (40%) whilst the rest were wishing to be fatter (21.2%). In general, student's perception regarding their

body image was resonated with their actual BMI for age. About 58% underweight students were wishing to be fatter, more normal students satisfied with their body (43.2%), 80.9% overweight students and 85.7% obese students were wishing to be thinner respectively. However, misperception existed among students, especially among underweight students (41.7%) who either satisfied with their current body weight or wishing to be thinner, and obese students (14.3%) who satisfied with their current body weight.

In Table 8, it displayed physical activity profile of the students. On average, students' PAQ-A scored 2.20 which a bit lower than the recommended value of 2.75 (Benítez-Porres et al., 2016). It is possibly due to uncertain situation caused by the outbreak of Corona Virus Disease 2019 (COVID-19) where social distancing rule has been applied. It strictly limits outdoor activities. Therefore, only 12.5% of the students were included in the physically active category. Their actual PAQ-A score is ranged from 1.03 to 4.54.

*Table 8. **Physical activity of the students (N: 433)***

Physical Activity Questionnaire – Adolescents (PAQ-A) score		
Mean ± SD		2.20 ± 0.54
Minimum - maximum		1.03 – 4.54
Physical activity level	**n**	**%**
Physically inactive (score < 2.75)	379	87.5
Physically active (score ≥ 2.75)	54	12.5

Students' nutrition knowledge score laid between 32 and 96 whilst their average score was 66.95 (Table 9). The recommendation set the score of 80 as a threshold for good category. Consequently, most of the students were under not good level of nutrition knowledge (80.6%).

*Table 9. **Nutrition knowledge of the students (N: 433)***

Nutrition knowledge score		
Mean ± SD		66.95 ± 12.82
Minimum - maximum		32 – 96
Nutrition knowledge level	**n**	**%**
Not good (< 80)	349	80.6
Good (≥ 80)	84	19.4

On media engagement, about 60% students were a frequent user who access food-related information more than 3-times a week (Table 10). Interestingly, although they trusted more in health workers (40.9%), they also considered celebrities (35.8%) more than researchers (17.8%) as their key informant. It also displayed that over 50% students had ever participated in activities related to food such as cooking club, traditional food exhibition, cooking demo, etc.

*Table 10. **Food-related media engagement of the students (N: 433)***

	n	Percentage
Frequency		
Moderate (< 3 times a week)	174	40.2
Frequent (≥ 3 times a week)	259	59.8
Key informant		
Researchers	77	17.8
Celebrities	155	35.8
Health workers	177	40.9
Other	24	5.5
Food-related events participation		
Ever	254	58.7
Never	179	41.3

In Table 11, it presented the mean score distribution of every items of Food Choice Questionnaires (FCQ). The top 3 highest mean scores were 3.47, 3.33, and 3.28 which were recorded on item 32, 33, and 10 respectively. These mean scores lay between "important" and "very important" of the 4-Likert's scale being applied in FCQ. Items, in particular no. 32 and 33, are under Religion subscale in the original FCQ, whilst item no. 10 is under Health subscale in the original FCQ.

*Table 11. **Food Choice Questionnaire (N: 433)***

	Item	Mean	SD
1	Is easy to prepare	2.60	0.842
2	Contains no additives	2.99	0.950
3	Is low in calories	2.59	0.854
4	Tastes good	3.19	0.871
5	Contains natural ingredients	3.02	0.886
6	Is not expensive	2.82	0.959
7	Is low in fat	2.74	0.885
8	Is familiar to me	2.57	0.960
9	Is high in fibre	2.89	0.859
10	Is nutritious[c]	3.28	0.863
11	Is easily available in shops and supermarkets	2.77	0.905
12	Is good value for money	2.89	0.912

	Item	Mean	SD
13	Cheers me up	2.84	0.981
14	Smells nice	2.95	0.925
15	Helps me cope with stress	2.92	0.961
16	Helps me control my weight	2.89	0.996
17	Has a pleasant texture	2.75	0.968
18	Is like the food I ate when I was a child	1.97	0.907
19	Keeps me healthy	3.22	0.868
20	Contains lots of vitamins and minerals	3.17	0.872
21	Contains no artificial ingredients	2.81	0.938
22	Keeps me awake and alert	2.83	0.942
23	Looks nice	2.50	0.953
24	Helps me relax	2.71	0.925
25	Is high in protein	3.11	0.851
26	Takes no time to prepare	2.67	0.952
27	Is good for my skin/teeth/hair/nails etc.	2.91	0.982
28	Makes me feel good	2.96	0.897
29	Is what I usually eat	2.60	0.903
30	Can be bought in shops close to where I live or work	2.67	0.922
31	Is cheap	2.74	0.981
32	Is not forbidden in my religion[a]	3.47	0.907
33	Is in harmony with my religious views[b]	3.33	0.883

[a-c]: the top 3-highest mean scores.

4.2 Food choice

Food choice of the students in this study was analyzed through Exploratory Factor Analysis (EFA) from the thirty-three FCQ's item. This EFA analyses were expected to result subscales representing food choice in adolescents, especially on high-school age or a late-phase adolescence. Also, some conditions should be met before running EFA.

Kaiser-Meyer-Olkin measure of sampling adequacy value of 0.6 is suggested to evaluate whether a study has an adequate sample for running factor analysis (Barbara G. Tabachnick & Fidell, 2007). This study resulted a value Kaiser-Meyer-Olkin measure of sampling adequacy as 0.954 which considered as sufficient. Therefore, factor analysis is able to run. Another condition was Bartlett's Test of Sphericity which showed the significance to do factor analysis (p-value < 0.05).

After following those condition, Principle Component Analysis (PCA) was performed aiming for eigenvalues more than 1. Thus, data were extracted from 33 variables into 5 components / factors. Each of these factors was representing 44.2%, 8.7%, 4.9%,

3.6%, 3.0% of all variables respectively. Factors then were processed with particular rotation method to get item variables that closely related each other within the factors. In this study, an Oblique technique was used considering factors within food choice are correlated (Barbara G. Tabachnick & Fidell, 2007). A Promax rotation method was used consequently for resulting higher loading factors through its orthogonal rotation in an Oblique technique.

*Table 12. **Food choice exploratory factor analysis (PCA extraction, Promax rotation)***

No	Original subscales*	Items	Factor 1	2	3	4	5
33	R	Is in harmony with my religious views	**0.93**	0.00	-0.01	-0.26	0.01
2	NC	Contains no additives	**0.87**	-0.05	-0.22	0.04	0.09
20	H	Contains lots of vitamins and minerals	**0.87**	0.00	0.00	0.05	-0.05
19	H	Keeps me healthy	**0.86**	-0.01	0.04	0.07	-0.10
10	H	Is nutritious	**0.85**	0.06	0.09	0.02	-0.21
25	H	Is high in protein	**0.81**	-0.08	0.07	0.09	-0.04
32	R	Is not forbidden in my religion	**0.74**	0.22	-0.07	-0.25	-0.01
27	H	Is good for my skin/teeth/hair/nails etc.	**0.68**	-0.14	0.14	0.09	0.07
9	H	Is high in fibre	**0.66**	0.00	0.03	0.23	-0.21
21	NC	Contains no artificial ingredients	**0.62**	0.05	-0.20	0.10	0.29
5	NC	Contains natural ingredients	**0.62**	0.03	-0.04	0.22	0.01
22	M	Keeps me awake and alert	*0.33*	0.07	0.15	0.12	0.32
6	P	Is not expensive	0.00	**0.92**	-0.13	0.12	-0.12
31	P	Is cheap	-0.06	**0.91**	-0.09	-0.02	0.04
12	P	Is good value for money	0.01	**0.85**	0.07	0.00	-0.12
11	C	Is easily available in shops and supermarkets	-0.02	**0.71**	0.08	0.05	0.01
30	C	Can be bought in shops close to where I live or work	-0.13	**0.70**	0.10	0.00	0.22
1	C	Is easy to prepare	0.13	**0.65**	-0.20	0.05	0.17
26	C	Takes no time to prepare	0.07	**0.48**	0.14	0.00	0.19
8	F	Is familiar to me	-0.07	**0.44**	0.20	0.20	-0.02
4	SA	Tastes good	0.24	**0.42**	*0.37*	-0.10	-0.30
29	F	Is what I usually eat	0.07	*0.33*	0.26	-0.20	0.30
15	M	Helps me cope with stress	-0.09	-0.05	**0.99**	0.02	-0.05
13	M	Cheers me up	-0.09	0.06	**0.91**	-0.01	-0.08
24	M	Helps me relax	0.01	-0.11	**0.84**	0.04	0.09

No	Original subscales*	Items	Factor				
			1	2	3	4	5
14	SA	Smells nice	-0.11	0.27	**0.74**	0.03	-0.07
23	SA	Looks nice	-0.06	-0.06	**0.70**	-0.02	0.27
28	M	Makes me feel good	*0.36*	-0.08	**0.65**	-0.09	0.03
3	WC	Is low in calories	0.08	0.08	-0.08	**0.81**	0.04
7	WC	Is low in fat	0.12	0.08	0.02	**0.75**	0.03
16	WC	Helps me control my weight	0.18	-0.08	0.31	**0.43**	0.15
18	F	Is like the food I ate when I was a child	-0.15	0.02	0.05	0.08	**0.85**
17	SA	Has a pleasant texture	0.25	0.06	*0.32*	-0.10	**0.39**

*R: religion, NC: natural content, H: health, M: mood, P: price, C: convenience, F: familiarity, SA: sensory appeal, WC: weight control.
**factors were shown in bold.

In the Table 12, it showed the result of Promax rotation on the 5-factors which is extracted using PCA. Factor loading of the item variables > 0.32 is the minimum recommendation to be considered as correlated items (Barbara G. Tabachnick & Fidell, 2007). High factor loading item are shown in bold to ease the understanding.

However, some item-variables shared overlapping variance among factors e.g item no. 4, 28, and 17. It means these items to some extent have a similarity on the factors or least variance among factors. Therefore, a specific cut off point 0.388 is taken to result stable factors. It causes an exclusion on item no. 22 in factor 1 and item no. 29 in factor 2, but it keeps item no. 17 so as to enables factor 5 for further analysis.

After item-variables found, factors were named accordingly with shared common variance from its items variables as shown in Table 13. Health and religion motive, Price and convenience motive, Comfort motive, Weight control motive, and Familiarity motive is respectively named for factor 1 to 5. Referring to the mean score value of each motives, rank order of the food choices was (1) Health and religion, (2) Comfort, (3) Price and convenience, (4) Weight control, and (5) Familiarity.

Reliability test are also performed in every food choice. It is showed strong reliability (Cronbach's α > 0.7), except for motive 5 or Familiarity (0.65). However, it still considered as acceptable (Taber, 2018). These motives were then used for linear regression analysis.

*Table 13. **Food choice structure***

No/subscale*		Items	Mean	SD	Reliability
Factor 1		**Motive 1: Health and religion**	**3.11**	**0.70**	**0.94**
33	R	Is in harmony with my religious views			(11 items)
2	NC	Contains no additives			
20	H	Contains lots of vitamins and minerals			
19	H	Keeps me healthy			
10	H	Is nutritious			
25	H	Is high in protein			
32	R	Is not forbidden in my religion			
27	H	Is good for my skin/teeth/hair/nails etc.			
9	H	Is high in fibre			
21	NC	Contains no artificial ingredients			
5	NC	Contains natural ingredients			
Factor 2		**Motive 2: Price and convenience**	**2.77**	**0.69**	**0.90**
6	P	Is not expensive			(9 items)
31	P	Is cheap			
12	P	Is good value for money			
11	C	Is easily available in shops and supermarkets			
30	C	Can be bought in shops close to where I live or work			
1	C	Is easy to prepare			
26	C	Takes no time to prepare			
8	F	Is familiar to me			
4	SA	Tastes good			
Factor 3		**Motive 3: Comfort**	**2.81**	**0.78**	**0.91**
15	M	Helps me cope with stress			(6 items)
13	M	Cheers me up			
24	M	Helps me relax			
14	SA	Smells nice			
23	SA	Looks nice			
28	M	Makes me feel good			
Factor 4		**Motive 4: Weight control**	**2.74**	**0.76**	**0.78**
3	WC	Is low in calories			(3 items)
7	WC	Is low in fat			
16	WC	Helps me control my weight			
Factor 5		**Motive 5: Familiarity**	**2.36**	**0.81**	**0.65**
18	F	Is like the food I ate when I was a child			(2 items)
17	SA	Has a pleasant texture			

*R: religion, NC: natural content, H: health, M: mood, P: price, C: convenience, F: familiarity, SA: sensory appeal, WC: weight control.

4.3   Linear regression analysis

*Table 14. **Factors associated with food choice: Health and religion***

	Coefficient β	*p*-value	95% CI	
Sex	-0.159	0.172	-0.387	0.069
Age	0.005	0.931	-0.102	0.111
Mother's education (less/high)	-0.179	0.155	-0.426	0.068
Fathers 's education (less/high)	0.092	0.458	-0.152	0.337
Stipend (IDR x10K)	0.002	0.719	-0.010	0.014
Nutritional status (z-score)	0.007	0.889	-0.089	0.103
Dietary habit				
7-times breakfast a week	0.121	0.223	-0.074	0.316
3-times meal a day	0.086	0.406	-0.117	0.290
Physical activity	**0.306**	**0.001***	**0.122**	**0.491**
Nutrition knowledge	0.004	0.292	-0.004	0.012
Body image perception				
Wishing to be thinner	-0.163	0.180	-0.400	0.075
Wishing to be fatter	-0.037	0.794	-0.316	0.242
Media engagement				
Frequency	0.026	0.217	-0.016	0.068
Event participation (ever, never)	-0.041	0.681	-0.237	0.155
Researchers	0.226	0.338	-0.238	0.691
Celebrities	0.123	0.582	-0.316	0.562
Health workers	0.278	0.211	-0.158	0.713

Based on the Table 14 above, physical activity of the students associated with food choice on health and religion motive (*p*-value < 0.05). It was a positive correlation (β = 0.306) meaning the more active students, the more they choose food with health and religion consideration. The increase of 1 unit of physical activity score increased 0.306-score of food choice on health and religion motive. (β = 0.306; *p*-value = 0.001)

*Table 15. **Factors associated with food choice: Price and convenience***

	Coefficient β	*p*-value	95% CI	
Sex	0.120	0.308	-0.111	0.351
Age	-0.024	0.657	-0.132	0.084
Mother's education (less/high)	-0.148	0.243	-0.398	0.101
Fathers 's education (less/high)	0.164	0.192	-0.083	0.412
Stipend (IDR x10K)	0.004	0.512	-0.008	0.016
Nutritional status (z-score)	-0.016	0.752	-0.113	0.081
Dietary habit				
7-times breakfast a week	-0.050	0.616	-0.248	0.147
3-times meal a day	-0.074	0.482	-0.279	0.132
Physical activity	-0.080	0.400	-0.266	0.106
Nutrition knowledge	0.003	0.387	-0.004	0.011
Body image perception				
Wishing to be thinner	-0.053	0.663	-0.294	0.187
Wishing to be fatter	-0.031	0.831	-0.312	0.251
Media engagement				
Frequency	**0.056**	**0.010***	**0.014**	**0.099**
Event participation (ever, never)	-0.130	0.196	-0.329	0.068
Researchers	-0.188	0.433	-0.657	0.282
Celebrities	-0.009	0.967	-0.453	0.434
Health workers	-0.105	0.640	-0.545	0.335

In the Table 15, frequency of accessing media to find any information related to food was significantly associated with food choice on price and convenience motives (*p*-value < 0.05). It was a subtle positive correlation ($\beta = 0.056$) implying those students who are more frequent on accessing the medias, were more likely to choose their food based on price and convenience aspects. The increase of 1 unit of frequency on accessing media increased 0.056-score of food choice on price and convenience motive. ($\beta = 0.056$; *p*-value = 0.010)

*Table 16. **Factors associated with food choice: Comfort***

	Coefficient β	*p*-value	95% CI	
Sex	-0.174	0.136	-0.402	0.055
Age	0.012	0.824	-0.095	0.119
Mother's education (less/high)	0.004	0.974	-0.243	0.251
Fathers 's education (less/high)	0.098	0.434	-0.147	0.342
Stipend (IDR x10K)	**0.018**	**0.003***	**0.006**	**0.029**
Nutritional status (z-score)	-0.006	0.895	-0.103	0.090
Dietary habit				
7-times breakfast a week	0.064	0.523	-0.132	0.259
3-times meal a day	-0.138	0.183	-0.342	0.066
Physical activity	0.070	0.454	-0.114	0.255
Nutrition knowledge	-0.002	0.646	-0.009	0.006
Body image perception				
Wishing to be thinner	-0.091	0.452	-0.329	0.147
Wishing to be fatter	-0.051	0.721	-0.330	0.228
Media engagement				
Frequency	**0.044**	**0.042***	**0.002**	**0.086**
Event participation (ever, never)	0.065	0.516	-0.131	0.261
Researchers	0.148	0.532	-0.317	0.613
Celebrities	0.184	0.409	-0.254	0.623
Health workers	0.076	0.733	-0.360	0.511

Stipend and frequency on accessing the medias were positively associated with food choice on comfort motive (Table 16). A subtle correlation ($\beta = 0.018$) reflected the students who had more stipend, were more likely to choose the foods that may lead them feeling comfort. The increase of 1 unit of stipend value increased 0.018-score of food choice on comfort motive. ($\beta = 0.018$; *p*-value = 0.003)

Frequently media access also implied more comfort consideration in student's food choice ($\beta = 0.044$). The increase of 1 unit of frequency on accessing media increased 0.044-score of food choice on comfort motive. ($\beta = 0.044$; *p*-value = 0.042)

Table 17. Factors associated with food choice: Weight control

	Coefficient β	p-value	95% CI	
Sex	-0.139	0.219	-0.360	0.083
Age	0.078	0.140	-0.026	0.181
Mother's education (less/high)	-0.219	0.073	-0.459	0.020
Fathers 's education (less/high)	0.103	0.392	-0.134	0.341
Stipend (IDR x10K)	-0.005	0.391	-0.016	0.006
Nutritional status (z-score)	0.015	0.749	-0.078	0.108
Dietary habit				
7-times breakfast a week	-0.004	0.966	-0.193	0.185
3-times meal a day	-0.011	0.915	-0.208	0.187
Physical activity	**0.438**	**0.000***	**0.259**	**0.616**
Nutrition knowledge	-0.005	0.173	-0.013	0.002
Body image perception				
Wishing to be thinner	0.084	0.475	-0.147	0.314
Wishing to be fatter	**-0.297**	**0.031***	**-0.567**	**-0.026**
Media engagement				
Frequency	0.024	0.239	-0.016	0.065
Event participation (ever/never)	-0.052	0.594	-0.242	0.138
Researchers	0.102	0.656	-0.348	0.553
Celebrities	0.075	0.729	-0.350	0.500
Health workers	0.088	0.683	-0.335	0.510

In Table 17, significant associations were found between physical activity and body image perception with food choice on weight control motive. A positive correlation found between physical activity and weight control motive. It means that students who were physically active placed more importance on weight control motive while choosing their foods. The increase of 1 unit of physical activity score increased 0.438-score of food choice on weight control motive. ($\beta = 0.438$; p-value = 0.000).

On the other hands, body image perception aspect, especially students who were wishing to be fatter, was less likely to consider weight control value when choosing the foods. The increase of 1 unit of wishing to be fatter score decreased 0.297-score of food choice on weight control motive. ($\beta = -0.297$; p-value = 0.031).

*Table 18. **Factors associated with food choice: Familiarity***

	Coefficient β	p-value	95% CI	
Sex	0.163	0.167	-0.068	0.393
Age	0.019	0.726	-0.089	0.127
Mother's education (less/high)	-0.080	0.526	-0.330	0.169
Fathers 's education (less/high)	-0.043	0.730	-0.290	0.204
Stipend (IDR x10K)	0.002	0.689	-0.009	0.014
Nutritional status (z-score)	-0.035	0.481	-0.132	0.062
Dietary habit				
7-times breakfast a week	-0.021	0.831	-0.219	0.176
3-times meal a day	0.061	0.558	-0.144	0.267
Physical activity	-0.076	0.425	-0.262	0.110
Nutrition knowledge	**-0.008**	**0.047**	**-0.016**	**0.000**
Body image perception				
Wishing to be thinner	-0.158	0.197	-0.398	0.082
Wishing to be fatter	-0.201	0.162	-0.482	0.081
Media engagement				
Frequency	0.026	0.224	-0.016	0.069
Event participation (ever, never)	0.013	0.901	-0.185	0.210
Researchers	0.376	0.116	-0.093	0.845
Celebrities	0.331	0.142	-0.112	0.774
Health workers	0.353	0.115	-0.086	0.793

On the Table 18, nutrition knowledge was significantly associated with food choice on familiarity motive. The increase of 1 unit of nutrition knowledge score decreased 0.008-score of food choice on familiarity motive. (β = -0.008; p-value = 0.047). It was an inverse subtle correlation that can also be implied as students who have more knowledge in nutrition aspects, were less likely to choose their food based on their former experiences.

Table 19. **Summary of associated factors towards food choices**

Factors	Health and religion	Price and convenience	Comfort	Weight control	Familiarity
	Food choice				
Sex					
Age					
Mother's education					
Fathers 's education					
Stipend			**a****		
Nutritional status					
Dietary habit					
7-times breakfast a week					
3-times meal a day					
Physical activity	**a****			**a*****	
Nutrition knowledge					**b***
Body image perception					
Wishing to be thinner					
Wishing to be fatter				**b***	
Media engagement					
Frequency		**a***	**a***		
Event participation					
Researchers					
Celebrities					
Health workers					

*p-value < 0.05, ** p-value < 0.005, *** p-value < 0.001
a: positive correlation, b: negative correlation

In Table 19, it provides a summary of associated factors towards the 5-food choices in this present study. On health and religion food choice, physical activity is the factor that positively correlated with food choice. A positive correlation also found between the frequency on accessing the media with price and convenience food choice. Explaining comfort food choice, stipend and media access frequency are the factors that positively correlated with the food choice. Weight control food choice, on the other hand, is positively influenced by physical activity whereas wishing to be fatter is inversely correlated with it. The same negative correlation also applied between nutrition knowledge with familiarity food choice.

CHAPTER V
DISCUSSION

5.1   Discussion

5.1.1   Food choice: Health and religion motive

Food choice on health and religion motives in this study were constructed by eleven-item variables. All six variables from the original health subscale were included in these motives, along with three variables from natural content subscale, and two variables from religion subscale by Marjaana Lindeman and Väänänen (2000). According to the mean value in Table 13, Health and religion motive considered as the most important of all food choice motives (mean score = 3.11 ± 0.70 SD). Health subscale can be summarized as nutrient content of the foods and its effect to the body, whilst natural content subscale was related to food safety on chemical substance. All the health variables were loaded in this motive meaning it was measured as the original FCQ version (Steptoe et al., 1995). A combination between health subscale and natural content subscale were common in the previous studies (Canales & Hernández, 2016; Maulida et al., 2016; Share & Stewart-Knox, 2012a). They also suggested to measure those subscales under one expanded subscale when assessing food choice in adolescents.

Interestingly, religion item variables were also loaded as important as health consideration among high school students in this study. According to the Table 11, religion variables had the highest mean score over all item variables (item no. 32, mean = 3.47 ± 0.907 SD; item no. 33, mean = 3.33 ± 0.883 SD). In contrast, a study by Maulida et al. (2016) religion variables were not loaded in any subscales. It is important to note that this present study was conducted among high school students, whilst the previous study was conducted among middle school students. Cognitive aspect will be fully developed during late phase of adolescents. It allows them to understand any possible consequences from their current behaviour (Brown et al., 2011). Consequently, this food choice labelled as Health and religion motive.

Physical activity was positively corelated with food choice on Health and religion motives (β = 0.306, p-value = 0.001). It implied that the more active the students, they considered more on health and religion while choosing their foods. It was consistent

with the previous study where Gaylis et al. (2019) found that adolescents who were thinking about health and wanting to improve health were them whose physical activity more than the recommendation. Also, adolescents with superior diet quality had higher physical activity levels than they who were in average diet quality. Likewise, them who were poor in diet quality had a lower physical activity levels compared with an average quality dieter (Hayes, Giles, Mahoney, & Kanarek, 2018). A study on food choice based on personality by M. Lindeman and Stark (1999) was also noteworthy. Females considered more in health motive when they aimed specific goals on exercise.

These previous studies, somehow paired health consideration with weight control intention or effort. It supported a study by Share and Stewart-Knox (2012b) that suggested to expand health motives in the FCQ by including weight control motives since adolescents considered it as a health motive as well. However, in this study, weight control motives were found grouping into a unique factor. It might because this study was dominated by female adolescents where in the previous study sex proportion seemed rather equal.

In religion aspect, on the other hand, this present study conflicted with the previous studies. Irish adolescents considered religion practice on their food choice, but it was placed as the least important than the other food choices (Share & Stewart-Knox, 2012a). The same result also happened among adults in a study that conducted by Marjaana Lindeman and Väänänen (2000). Sampling technique and inclusion criteria in this present study allowed high school students to participate regardless their type of schools. The number of students from religion-based high schools seemed taking part in this result.

5.1.2 Food choice: Price and convenience motive

Food choice on price and convenience motive in this study were constructed by eight-item variables. All three variables from the original price subscale were included in this motive, with three variables from convenience subscale, one variable from familiarity subscale, and one variable from sensory appeal subscale. Variables from

familiarity and sensory appeal considered as related to convenience point of view. So, these four subscales then labeled as price and convenience motive.

Factor that significantly associated with this motive was media engagement. Frequency on accessing media to get food related information was somehow positively correlated with price and convenience food choice motive ($\beta = 0.056$, p-value = 0.010). Students who frequently accessed the medias placed more importance on price and convenience while choosing their foods. It was supported with a study by Scully et al. (2012) where students who were included as more frequent in accessing the media were more likely had tried advertised food at least once in the past month. In practical, those frequent media users were also more likely to consume salty and sweet snacks, sugar-sweetened drinks, and fast foods. These kinds of foods were relatively low in price and commonly available in types of store. Since medias often focus promoting either processed or manufactured food, exposure to this advertising increased awareness of and demand for those advertised foods (*Nutrition at a Glance*, 2016).

Besides those drawbacks regarding the influence of medias, some benefits also explained through recent studies. An online-based study by Raggatt et al. (2018) found that fitpiration or fitness inspiration increased access to health information and social support. Fitpiration was a term referring to a trending activity in social media related to nutrition and fitness. Gomez-Lopez et al. (2017) utilized the benefit of social media accuracy as supporting method to verify the availability of healthy grocery in neighborhoods. Also, with todays' living style where time is priceless, some studies suggested to widen the understanding of convenience food. It should be shifted from unhealthy labeled food into some method or ways fulfilling personal dietary needs (Meah & Jackson, 2017). Anetta (2018) then, revealed the attitudes of millennial consumers toward convenience food which the strongest correlation was established between attitudes and economic activity. Further analysis mentioned that segments of the consumers were seeking innovative products, expecting products containing social attributes, and interested in food products that are easy to prepare and use, either processed or semi-processed, ready for consumption, or ready to be served.

5.1.3   Food choice: Comfort motive

Food choice on comfort motive in this study were constructed by six-item variables. Four variables from the original mood subscale were included in this motive, together with two variables from sensory appeal subscale. These combinations then labeled as comfort motive and were also partially supporting the previous studies (Maulida et al., 2016; Share & Stewart-Knox, 2012a).

Stipend was positively corelated with food choice on comfort motive ($\beta = 0.018$, p-value = 0.003). Students who were given more money by their parents were put more importance on comfort motive while choosing the foods. In this study, students were given about Rp87.600,00 or equal to USD 6.13 in a week / 5-school days. This amount is considered as enough for high school student. It has no association between stipend and price and convenience motive. Descriptive mean score also showed that comfort motive has a higher means score than price and convenience motive. Thus, in this case, students might consider more in fulfilling their unique preference over rating food's price (Lusk, 2019). On the contrary to a study by Maulida et al. (2016), comfort motive had no associated factor at all. Tracing back to descriptive item variables constructing comfort motives, it may due to stress experienced by high school students was more complex than middle school students. Comparing with the initial study in adult, sensory appeal had the highest mean score over all subscales. Although it was not included mood item variables, in the previous study sensory appeal was also significantly associated with different income levels. A higher mean score in sensory appeal more likely yielded from a higher income level of the respondents (Steptoe et al., 1995).

Another associated factor towards comfort food choice motives was media engagement. A subtle positive correlation found between media access frequency and comfort food choice motive ($\beta = 0.044$, p-value = 0.042). Frequent media user related to food information were placed more importance on comfort in their daily food choice. It somehow reflected by the previous study highlighting social support benefit on health and nutrition issues among the media users. It simultaneously eased their problem and got suggestions or new practical knowledge (Raggatt et al., 2018). Media access enables us to get many information including a place where foods are

available and types of foods. Environmental or situational variables were known as influenced factors in food intake. Despite this ambiance might take a control on food intake (Stroebele & De Castro, 2004), persons' food choice already built long before consumption (Rozin, 2007). Moreover, mood and sensory item variables under comfort subscales, intertwined with experience and memories that believed as an early and fundamental food choice.

5.1.4 Food choice: Weight control motive

Food choice on weight control motive in this study were constructed by three-item variables. All of them were from the original weight control subscale. Previous study yielded a contrast result regarding weight control. (Share & Stewart-Knox, 2012a) included weight control variables under health subscale, whilst Maulida et al. (2016) omitted them since its reliability value were so low. The result of this study supporting similar finding by Canales and Hernández (2016). Weight control motive were grouped separately and has a strong reliability value of 0.784.

In this study, associated factors toward weight control food choice were physical activity ($\beta = 0.438$, p-value < 0.001) and body image perception of the students ($\beta = -0.297$, p-value < 0.031). A positive correlation between physical activity and weight control motive means physically active students more likely to consider weight control while choosing the foods. It was consistent with previous study where students who did exercise aiming to lose or control their weight were more likely to follow the recommendation of fruits and vegetables consumption, and to decrease high fat food consumption (Lowry et al., 2000).

Body image among students who were wishing to be fatter was inversely related with weight control food choice motive. They put less importance on weight control motive compared to the other food choice motive. This study supporting similar finding reported by Gaylis et al. (2019) about dietary intake and body weight perception. Adolescents who consider themselves as thin consumed calories and fat on their daily meals more than fit or overweight students. From the same study, the same principle also applied between dietary intake and weight control. Adolescents who were tried to gain weight consumed more soda and least salad compare to the

other categories. It is because some were striving to have a good appearance more likely to apply weight control motive on their food choice (M. Lindeman & Stark, 1999). Although females were often predicted to consider more in weight control (Wardle et al., 2004), this study has no significant association between respondents' sex and food choice in general. Interestingly, a study by Steptoe et al. (1995) found that males were put more importance on weight control motive than females.

5.1.5 Food choice: Familiarity motive

Food choice on familiarity motive in this study was constructed by two-item variables. One variable was from the original familiarity subscale and another variable was from mood subscale. Sensory appeal may retain as memories (Rozin, 2007). Therefore, it included and labeled under familiarity motive.

This motive was quite infirm in the previous adolescence studies. Originally, familiarity subscale consisted of three items with Cronbach's alpha value of 0.70 among adult respondents (Steptoe et al., 1995). A further study by (Share & Stewart-Knox, 2012a) found that familiarity subscale was separated into two subscales and were not explained due to irrelevance with adolescents. Maulida et al. (2016) included only one item variable of familiarity on convenience and price motive considering factor loading value. In this present study, only two item variables of familiarity were included. One variable was grouped under price and convenience motive. Another one stood as familiarity motive along with one item variable from sensory appeal original subscale.

Despite those various result, researcher kept this original familiarity item as familiarity motive to explain more in the analysis part of the study. Therefore, specific cut off point 0.388 was decided during factor rotation. It also helped to construct factor that shared loading factors (Table 12). The reliability value was 0.65, a bit low but still considered as acceptable. It was because familiarity motive consisted only two-item variables.

Nutrition knowledge was significantly associated with familiarity motive. It was a subtle negative relation between nutrition knowledge of the students with familiarity

food choice motive (β = -0.008, *p*-value = 0.047). Students with less nutrition knowledge were more likely to choose the foods based on familiarity, whilst students with more nutrition knowledge were less likely to choose the foods based on familiarity.

It is common for people to choose familiar food. It recalls memories, makes feeling comfort and safe, or is a religion / tradition practice. Besides, adolescence is a transitional phase from childhood to adulthood. Food choice mostly came from mother's food preference during childhood (Brown et al., 2011; Marcus, 2013; Meiselman & Bell, 2003). However, preference reversal might increase diet variety and diversity (Lusk, 2019). Nutrition knowledge in this issue enables people to make a sensible food selection (Whitney & Rolfes, 2008). The more knowledgeable children, it might weaken the relationship between product evaluations and its consumption (Tarabashkina et al., 2016). They might able to use their knowledge when deciding to consume their foods. Also, an improve of healthy food knowledge greatened the likelihood for choosing food based on health and weight concern (Miedema, Bowes, Hamilton, & Reading, 2016).

5.2 Conclusion

Five adolescents' food choices were found in this study. They were Health and religion, Price and convenience, Comfort, Weight control, and Familiarity. A major difference compare to the previous study was religion subscale having the highest means score of all FCQ items and placed in the same new subscale as health. It is discussed that in a late phase of adolescence, cognitive aspect will be fully developed. Adolescents start considering any consequences in the future from what they do in the present time. Also, this study recruited high school students regardless their type of schools including religion-based school. It allowed more students to participate having different family background on religion perspectives.

Stipend that including on general characteristics, physical activity, nutrition knowledge, body image perception, and media engagement were significantly associated with food choices. Physically actives students were more likely considered health and religion while choosing their foods. They were also placed more

importance on weight control on their daily food choice. Students who were given more money by their parents were put more importance on comfort motive while choosing the foods. Meanwhile, students with less nutrition knowledge were more likely to choose the foods based on familiarity. As for students who were wishing to be fatter, they put less importance on weight control motive compare to the other food choice motive. Students who frequently accessed the medias placed more importance on price and convenience while choosing their foods. Those frequent media users were also placed more importance on comfort on their daily food choice.

5.3 Recommendation

5.3.1 Policy maker

This study revealed slightly moderate relation between media access and food choice. Thus, it is suggested for health practitioner or related stakeholder to expand and utilize media more for healthy lifestyle. We should advert and require physical activity in every students' activity or agenda. We may also encourage and monitor a suggestion by Ministry of Health of the Republic of Indonesia for the schools to have thirty-minutes physical activity before class. It may rise both health and religion, and weight control food choice motives. Through kind of medias, family may also be encouraged assuring familiarity food choice on adolescents by having healthy meals for children since their early childhood period.

Regarding an importance on high school students' comfort food choice, technical regulation may be needed for food production personnel. It is because comfort foods are expected to be nutritious. So, it may support healthy food availability especially for high school students who are considering comfort on their daily food choice.

5.3.2 High school student

Busy life during high school period may become the opportunity for adolescents to meet a minimum 60-minutes per day physical activity recommendation. Besides, the activity can be either in the form of an individual or a group physical game, recreation, walk, or doing household chores. So, physical activity is simple, and it is possible to do regardless of uncertain condition such as COVID-19 outbreak. Once adolescents are physically active, they tend to consider health and weight control while choosing their food.

High school students are also encouraged to access information related to food on any kind of medias. It may expand their understanding on convenience food choice that being shifted into specific nutrient-content consideration.

5.3.3 Further research

Further researches are expected to measure behavioral change resulted from the intervention applying this study result. It would be more comprehensive if it could also measure the retention of the intervention when those adolescents reach their adulthood. Real physical measurement for calculating nutritional status is also suggested.

5.4 Limitation of the study

This study is a cross-sectional study design by which cannot explain causal relationship between factors and Food Choice. It is also conducted in short periods of time and limited to specific group of population. Thus, the result cannot generalize for adolescent as a whole population. However, since Depok is one of urban and metropolitan area, it might relevant for the other similar setting.

One of the independent variables is the physical activity. It is measured by Physical Activity Questionnaire for Adolescent (PAQ-A). These questionnaires, like the other physical activity questionnaires, are meant to measure respondent's activity in the past week. However, data collection of this study is conducted during the uncertain situation with a social distancing rule. There is no schools, no physical education, and doing an outdoor activity which were also strictly not recommended. It might affect the result of physical activity variable although most of the students are under physically inactive measurement as expected.

Data on body weight and height of the participants in this study are also obtained based on self-reported data. It might be either over- or under-reported since it relies on participants memory from their last body measurement. Consequently, the result of BMI for age variable which calculated using these data might be affected.

APPENDIX

1. Food choice questionnaires

No	Subscale	Items	Steptoe et al. (1995)	Marjaana Lindeman and Väänänen (2000)	Present study*
22	Health	Contains a lot of vitamins and minerals	√		√
29	Health	Keeps me healthy	√		√
10	Health	Is nutritious	√		√
27	Health	Is high in protein	√		√
30	Health	Is good for my skin/teeth/hair/nails etc	√		√
9	Health	Is high in fibre and roughage	√		√
16	Mood	Helps me cope with stress	√		√
34	Mood	Helps me to cope with life	√		√
26	Mood	Helps me relax	√		√
24	Mood	Keeps me awake/alert	√		√
13	Mood	Cheers me up	√		√
31	Mood	Makes me feel good	√		√
1	Convenience	Is easy to prepare	√		√
15	Convenience	Can be cooked very simply	√		Irrelevant
28	Convenience	Takes no time to prepare	√		√
35	Convenience	Can be bought in shops close to where I live or work	√		√
11	Convenience	Is easily available in shops and supermarkets	√		√
14	Sensory appeal	Smells nice	√		√
25	Sensory appeal	Looks nice	√		√
18	Sensory appeal	Has a pleasant texture	√		√
4	Sensory appeal	Tastes good	√		√
2	Natural content	Contains no additives	√		√
5	Natural content	Contains natural ingredients	√		√
23	Natural content	Contains no artificial ingredients	√		√
6	Price	Is not expensive	√		√
36	Price	Is cheap	√		√
12	Price	Is good value for money	√		√
3	Weight control	Is low in calories	√		√
17	Weight control	Helps me control my weight	√		√
7	Weight control	Is low in fat	√		√

No	Subscale	Items	Steptoe et al. (1995)	Marjaana Lindeman and Väänänen (2000)	Present study*
33	Familiarity	Is what I usually eat	√		√
8	Familiarity	Is familiar	√		√
21	Familiarity	Is like the food I ate when I was a child	√		√
20	Ethical concern	Comes from countries I approve of politically	√	√	Irrelevant
32	Ethical concern	Has the country of origin clearly marked	√	√	Irrelevant
19	Ethical concern	Is packaged in an environmentally friendly way	√	√	Irrelevant
A	Animal welfare	Has been produced in a way that animals have not experienced pain		√	Irrelevant
B	Animal welfare	Has been produced in a way that animals' rights have been respected		√	Irrelevant
C	Environmental protection	Has been prepared in an environmentally friendly way		√	Irrelevant
D	Environmental protection	Has been produced in a way which has not shaken the balance of nature		√	Irrelevant
E	Political value	Comes from a country in which human rights are not violated		√	Irrelevant
F	Political value	Has been prepared in a way that does not conflict with my political values		√	Irrelevant
G	Religion	Is not forbidden in my religion		√	√
H	Religion	Is in harmony with my religious views		√	√

*using the FCQ based on a study by Maulida et al. (2016)
A-H: subscales from Marjaana Lindeman and Väänänen (2000)

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2. Research questionnaires

a) Bahasa and web version

(Online questionnaires available at bit.ly/foodchoice-highschools)

Section 1 of 7

Faktor-faktor yang berhubungan dengan Pemilihan Makanan pada siswa SMA di Depok, Indonesia.

Halo, perkenalkan, nama saya Syarifah Aqilah, mahasiswa jenjang pendidikan Master di College of Public Health Sciences, Chulalongkorn University, Thailand.
Saat ini saya sedang melakukan penelitian dalam rangka penyusunan tesis dengan judul Faktor-faktor yang berhubungan dengan Pemilihan Makanan pada siswa SMA di Depok, Indonesia (Factors associated with food choice among high school students in Depok, Indonesia).
Saya mengharapkan kesediaan Adik untuk meluangkan waktu sekitar 5-10 menit untuk mengisi kuesioner ini.

Penelitian ini bertujuan untuk mengetahui gambaran Food Choice pada siswa SMA di Depok dan memastikan faktor-faktor yang berhubungan dengan Food Choice tersebut, diantaranya karakteristik umum, pengetahuan gizi, persepsi citra tubuh, dan pengaruh media. Oleh karena itu, kuesioner ini terdiri dari 5 bagian sesuai dengan faktor-faktor yang telah disebutkan.

Food Choice dianggap penting karena berkaitan dengan kebiasaan makan yang dapat mempengaruhi status gizi dan status kesehatan remaja saat ini dan saat dewasa kelak. Diharapkan dengan mengetahui Food Choice dan faktor-faktornya, dapat dilakukan evaluasi dan dapat menentukan intervensi yang diperlukan selanjutnya.

Adik bebas menentukan keikutsertaan dalam penelitian ini tanpa paksaan apapun.
Jika ada pertanyaan, Adik dapat bertanya kepada peneliti.
Segala informasi yang Adik berikan, akan dijaga kerahasiaannya oleh peneliti.

Atas perhatian dan kerjasama Adik, saya mengucapkan terima kasih.

Peneliti   : Syarifah Aqilah, S.Gz
Email   : 6274017853@student.chula.ac.th
Telp/whatsapp : +66 647593174

Nama Lengkap *

Short answer text

Saya menyatakan bersedia menjadi responden dan menjawab serangkaian pertanyaan pada kuesioner penelitian ini dengan sebenar-benarnya, juga dengan sepengetahuan orangtua. *

○ Ya

○ Tidak

After section 1   Continue to next section

Section 2 of 7

Karakteristik Responden

Bagian ini terdiri dari pertanyaan berkaitan dengan data diri, kebiasaan makan, dan aktivitas fisik.

A. Data diri
Description (optional)

Asal sekolah *

Short answer text

Jenis sekolah *

1. Negeri

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Kelas *

1. 10
2. 11
3. 12

Penjurusan *

○ IPA

○ IPS

○ Other...

No HP *

nomor yang terdaftar aplikasi whatsapp akan menjadi lebih baik

Short answer text

Alamat email *

Short answer text

Manakah yang lebih aktif atau lebih sering digunakan untuk komunikasi? *

1. Nomor telp (whatsapp)

Tanggal lahir *

Month, day, year

Pendidikan terakhir Ibu *

1. Tamat SD
2. Tamat SMP
3. Tamat SMA
4. Tamat akademi/diploma
5. Tamat S1
6. Tamat S2
7. Tamat S3

Pendidikan terakhir Ayah *

1. Tamat SD
2. Tamat SMP
3. Tamat SMA
4. Tamat akademi/diploma
5. Tamat S1
6. Tamat S2

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Uang saku dalam seminggu *

mohon ditulis dengan detil, misal: 15000 -> bukan 15 saja

Short answer text

Berat badan *

dalam kilogram (kg)

Short answer text

Tinggi badan *

dalam centimeter (cm)

Short answer text

Jenis kelamin *

1. Laki-laki
2. Perempuan

B. Kebiasaan makan

Description (optional)

1. Berapa kali Adik makan dalam sehari? *

Short answer text

2. Berapa kali Adik makan snack / camilan / makanan atau minuman selingan dalam sehari? *

Short answer text

3. Makanan atau minuman apa yang paling sering Adik konsumsi sebagai snack / camilan / selingan? *

Short answer text

4. Berapa kali Adik sarapan dalam seminggu?

sarapan: makan pagi sebelum jam 10.00

Short answer text

C. Aktivitas fisik

Kuesioner ini bermaksud mencari tahu level aktivitas fisik Adik dalam kurun 7 hari terakhir (seminggu terakhir). Aktivitas fisik tsb termasuk jenis olahraga atau kegiatan yang membuatmu berkeringat / kaki terasa pegal / permainan yang membuatmu bernafas berat / terengah-engah seperti main lompat tali, berlari, memanjat, senam, dll.

Perlu diingat:
1. Tidak ada jawaban benar atau salah karena ini bukan tes.
2. Jawablah seluruh pertanyaan dengan sebenar-benarnya & seakurat mungkin — jawabanmu sangat penting

1. Aktivitas fisik di waktu luangmu: Apakah Adik melakukan aktivitas seperti di bawah ini dalam 7 hari terakhir? Jika ya, berapa kali Adik melakukannya? *

| Tidak | 1 - 2 kali | 3 - 4 kali | 5 - 6 kali | 7 kali atau lebih |

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Jogging ○ ○ ○ ○ ○

Lari ○ ○ ○ ○ ○

Futsal ○ ○ ○ ○ ○

Bola basket ○ ○ ○ ○ ○

Renang ○ ○ ○ ○ ○

Badminton ○ ○ ○ ○ ○

Speak bola ○ ○ ○ ○ ○

Bola voli ○ ○ ○ ○ ○

2. Dalam 7 hari terakhir, seberapa aktif dirimu saat jam pelajaran PJOK (bermain dengan semangat seperti lari, lompat, lempar/passing)? *

○ Saya tidak mengikuti belajar pelajaran PJOK

○ Hampir tidak aktif

○ Terkadang aktif

○ Cukup sering aktif

○ Selalu aktif

3. Dalam 7 hari terakhir, apa yang biasanya Adik lakukan saat jam istirahat selain makan siang? *

○ Duduk (mengobrol, membaca, mengerjakan tugas, bermain gadget)

○ Berlari atau bermain sebentar

○ Berlari dan melakukan sedikit permainan fisik

○ Berlari dan melakukan permainan fisik berat (basket, voli, futsal, dll)

4. Dalam 7 hari terakhir, berapa kali Adik berolahraga / menari / melakukan permainan fisik yang membuat Adik bergerak dengan sangat aktif sepulang sekolah? *

○ Tidak pernah

○ 1 kali

○ 2 atau 3 kali

○ 4 kali

○ 5 kali

5. Dalam 7 hari terakhir, berapa kali Adik berolahraga / menari / melakukan permainan fisik yang membuat Adik bergerak dengan sangat aktif di sore/malam hari? *

○ Tidak pernah

○ 1 kali

○ 2 atau 3 kali

○ 4 atau 5 kali

○ 6 atau 7 kali

6. Pada weekend yang lalu, berapa kali Adik berolahraga / menari / melakukan permainan fisik *

Tidak pernah

○ 1 kali

○ 2 - 3 kali

○ 4 - 5 kali

○ 6 kali atau lebih

7. Manakah dari pernyataan di bawah ini yang paling menggambarkan diri Adik dalam 7 hari terakhir? *

Baca seluruh (5) pernyataan terlebih dahulu sebelum memutuskan satu pernyataan yang paling menggambarkan dirimu.

○ Selalu atau hampir setiap waktu luang saya gunakan untuk melakukan aktivitas fisik ringan (hanya sedi...

○ Saya kadang-kadang (1-2 kali selama seminggu kemarin) melakukan aktivitas fisik di waktu luang (bero...

○ Saya cukup sering (3-4 kali selama seminggu kemarin) melakukan aktivitas fisik di waktu luang.

○ Saya sering (5-6 kali selama seminggu kemarin) melakukan aktivitas fisik di waktu luang.

○ Saya sangat sering (7 kali atau lebih selama seminggu kemarin) melakukan aktivitas fisik di waktu luang.

8. Tandai seberapa sering Adik melakukan aktivitas fisik (seperti berolahraga, melakukan permainan fisik, atau aktivitas fisik lain) pada setiap harinya dalam seminggu terakhir. *

	Tidak beraktivit...	Sedikit beraktiv...	Cukup sering b...	Sering beraktiv...	Sangat sering ...
Senin	○	○	○	○	○
Selasa	○	○	○	○	○
Rabu	○	○	○	○	○

Jumat	○	○	○	○	○
Sabtu	○	○	○	○	○
Minggu	○	○	○	○	○

9. Apakah Adik sakit di minggu yang lalu, atau adakah sesuatu yang menghalangimu untuk melakukan kegiatan fisik seperti biasanya? *

○ Ya

○ Tidak

Jika Adik menjawab "ya" pada pertanyaan sebelumnya, apa yang menghambat Adik melakukan aktivitas fisik tersebut?

Short answer text

After section 2   Continue to next section

Section 3 of 7

Persepsi citra tubuh siswa Laki-laki

Bagian ini adalah untuk menggali penilaian Adik terhadap bentuk tubuh diri Adik sendiri.

Dari beberapa gambar di bawah ini, gambar mana yang sesuai dengan bentuk tubuh Adik? *

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○ Gambar 1
○ Gambar 2
○ Gambar 3
○ Gambar 4
○ Gambar 5

Dari beberapa gambar di bawah ini, gambar mana yang merupakan bentuk tubuh favorit *
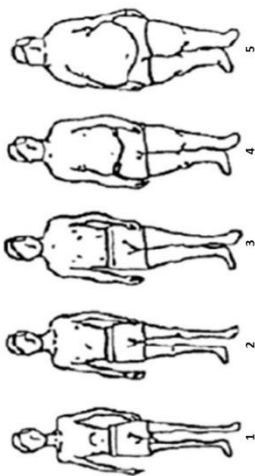
○ Gambar 1
○ Gambar 2
○ Gambar 3
○ Gambar 4
○ Gambar 5

After section 3   Go to section 5 (Pengetahuan gizi) ▸

Section 4 of 7

Persepsi citra tubuh siswa Perempuan

Description (optional)
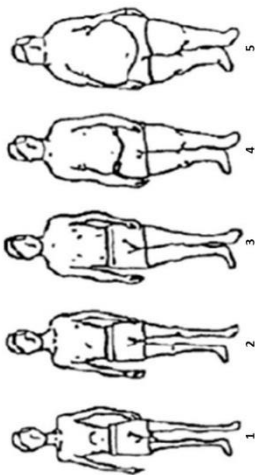
57

Dari beberapa gambar di bawah ini, gambar mana yang sesuai dengan bentuk tubuh Adik ? *

○ Gambar 1

○ Gambar 2

○ Gambar 3

○ Gambar 4

○ Gambar 5

Dari beberapa gambar di bawah ini, gambar mana yang merupakan bentuk tubuh favorit

*
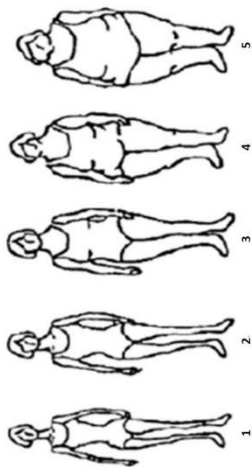
○ Gambar 1

○ Gambar 2

○ Gambar 3

○ Gambar 4

○ Gambar 5

After section 4   Continue to next section   ▶

Section 5 of 7

Pengetahuan gizi

Bagian ini terdiri dari pertanyaan seputar pengetahuan tentang makanan, zat gizi, rekomendasi ahli, dan efek makanan terhadap kesehatan.

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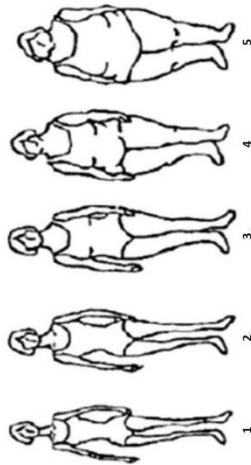
1. Manakah dari penyakit di bawah ini yang berkaitan dengan konsumsi gula? *

○ Tekanan darah tinggi

○ Diabetes melitus

○ Anemia

2. Manakah dari penyakit di bawah ini yang berkaitan dengan konsumsi garam? *

○ Tekanan darah tinggi

○ Diabetes melitus

○ Anemia

3. Manakah dari pilihan di bawah ini yang direkomendasikan untuk mencegah penyakit *

○ Konsumsi sedikit sayur

○ Konsumsi sedikit minyak ikan

○ Konsumsi sedikit lemak trans

4. Manakah dari pilihan di bawah ini yang direkomendasikan untuk mencegah diabetes? *

○ Makan lebih banyak sayur

○ Minum lebih banyak jus buah

○ Makan lebih banyak daging olahan

5. Jika seorang dewasa memiliki Indeks Masa Tubuh (IMT) 23kg/m2, apakah status gizinya? *

○ Underweight

○ Normal

○ Overweight

○ Obesitas

6. Manakah dari cara memasak di bawah ini yang cenderung tidak menambahkan *

○ Dipanggang

○ Dikukus

○ Dioven

○ Ditumis

7. Dalam seminggu, berapa kali seseorang direkomendasikan untuk sarapan? *

○ 3 kali

○ 5 kali

○ 7 kali

8. Berapa banyak batas maksimal konsumsi minyak dalam sehari yang direkomendasikan para ahli (tercantum dalam tumpeng gizi seimbang)? *

○ 4 sendok makan (50 gram)

5 sendok makan (67 gram)

9. Berapa banyak batas maksimal konsumsi gula dalam sehari yang direkomendasikan para ahli (tercantum dalam tumpeng gizi seimbang)? *

○ 4 sendok makan (50 gram)

○ 1 sendok teh (5 gram)

○ 5 sendok makan (67 gram)

10. Berapa banyak batas maksimal konsumsi garam dalam sehari yang direkomendasikan para ahli (tercantum dalam tumpeng gizi seimbang)? *

○ 4 sendok makan (50 gram)

○ 1 sendok teh (5 gram)

○ 5 sendok makan (67 gram)

Menurutmu manakah dari makanan di bawah ini yang cenderung berserat tinggi atau rendah? *

	Tinggi serat	Rendah serat
11. Oatmeal	○	○
12. Nasi putih	○	○
13. Telur	○	○
14. Nanas	○	○
15. Pasta	○	○

Apakah menurutmu makanan di bawah ini termasuk sumber protein? *

	Ya	Tidak
16. Daging unggas	○	○
17. Mentega	○	○
18. Kacang-kacangan	○	○

Apakah menurutmu makanan di bawah ini termasuk sumber karbohidrat? *

	Ya	Tidak
19. Keju	○	○
20. Pasta	○	○
21. Kentang	○	○

Berdasarkan 'Isi Piringku', seberapa banyak jenis makanan di bawah ini sebaiknya dikonsumsi dalam satu kali waktu makan? (pasangkan jenis makanan dengan nomor di dalam Piring) *

60

	bagian 1 atau 4	bagian 2 atau 3
22. Sumber karbohidrat	○	○
23. Lauk-pauk	○	○
24. Sayur	○	○
25. Buah	○	○

Untuk menjawab 3 pertanyaan terakhir selanjutnya, perhatikan 2 gambar di berikut ini.

Gambar 1

Gambar 2

26. Manakah dari 2 produk makanan di atas yang memiliki lebih banyak energi total per takaran saji? *

○ gambar 1

○ gambar 2

27. Manakah dari 2 produk makanan di atas yang memiliki lebih banyak serat per takaran saji? *

○ gambar 1

○ gambar 2

28. Manakah dari 2 produk makanan di atas yang memiliki lebih banyak energi total per kemasan? *

○ gambar 1

○ gambar 2

After section 5   Continue to next section

Section 6 of 7

Pengaruh media

Bagian ini bertujuan untuk menggali interaksi Adik dengan berbagai jenis media yang berkaitan dengan makanan.

1. Media apa saja yang biasa Adik akses untuk mendapatkan informasi tentang makanan? *
Boleh memilih lebih dari satu.

☐ Buku

☐ Majalah

☐ Koran

☐ Media sosial

☐ Televisi

☐ Berita online

☐ Youtube / video online

☐ Other...

2. Berapa kali dalam seminggu Adik mengakses media yang berkaitan dengan makanan tersebut di atas? *

Short answer text

3. Dalam mencari informasi tentang makanan, siapa yang Adik jadikan sumber informasi? *

○ Peneliti/pakar (contoh: LIPI, kementerian kesehatan, jurnal, dll)

○ Selebriti (contoh: artis, selebgram, reviewer makanan, dll)

○ Petugas kesehatan (contoh: ahli gizi, perawat, dokter)

○ Other...

4. Apakah Adik tergabung dalam aktivitas klub yang berkaitan dengan makanan? *
contoh: klub tataboga, klub pengembangan produk makanan, dll.

○ Ya

○ Tidak

5. Apakah Adik pernah menghadiri acara yang berkaitan dengan makanan? *
contoh: pameran kuliner, bazar makanan daerah, demo masak, dll

○ Ya

○ Tidak

After section 6   Continue to next section

Section 7 of 7

Food Choice

Bagian berikut adalah tentang pemilihan makanan, yang merupakan inti dari penelitian ini.

Respon yang diharapkan adalah pendapat Adik mengenai seberapa penting pernyataan pada kolom paling kiri dalam pemilihan makananmu.

Pilihan penilaian Adik, yaitu salah satu di antara Sangat Tidak Penting, Agak Penting, Penting, dan Sangat Penting.

Penting bagi saya bahwa makanan yang saya konsumsi sehari-hari: *

	Sangat Tidak Penti...	Agak Penting	Penting	Sangat Penting
1. Mudah untuk dis...	○	○	○	○
2. Tidak mengandu...	○	○	○	○
3. Rendah kalori	○	○	○	○
4. Rasanya enak	○	○	○	○
5. Mengandung ba...	○	○	○	○
6. Tidak mahal	○	○	○	○
7. Rendah lemak	○	○	○	○
8. Makanan yang ti...	○	○	○	○
9. Kaya akan serat	○	○	○	○
10. Bergizi	○	○	○	○
11. Mudah didapat...	○	○	○	○

13. Membuatku ce...	○	○	○	○
14. Aromanya enak	○	○	○	○
15. Membantuku ...	○	○	○	○
16. Membantuku ...	○	○	○	○
17. Nyaman saat d...	○	○	○	○
18. Seperti makan...	○	○	○	○
19. Menjagaku seh...	○	○	○	○
20. Mengandung b...	○	○	○	○
21. Tidak mengand...	○	○	○	○
22. Menjaga agar a...	○	○	○	○
23. Terlihat menarik	○	○	○	○
24. Membantuku u...	○	○	○	○
25. Kaya akan prot...	○	○	○	○
26. Tidak memaka...	○	○	○	○
27. Baik untuk kulit...	○	○	○	○
28. Membuatku m...	○	○	○	○
29. Yang biasa say...	○	○	○	○
30. Dapat dibeli di t...	○	○	○	○

32. Tidak dilarang ...

33. Dianjurkan oleh...

b) English version

RESEARCH QUESTIONNAIRE

FACTORS ASSOCIATED WITH FOOD CHOICE AMONG HIGH SCHOOL STUDENTS IN DEPOK, INDONESIA

Hello. I am Syarifah Aqilah, master student of College of Public Health Sciences Chulalongkorn University. I am conducting research for my thesis entitled Factors associated with food choice among high school students in Depok, Indonesia.

It would be my pleasure to have you as a respondent in this research. It will take about 5-10 minutes to complete these questionnaires.

The study is aimed to explore food choice among high school students in Depok and to identify associated factors including general characteristics, nutrition knowledge, body image perception, and media engagement. Therefore, these questionnaires consist of 5 parts as mentioned factors before.

Food choice is considered as essential because it is related with eating habit in adolescents that might influence nutritional status as well as health status in adulthood. Through food choice and its associated factors understanding, tailored intervention is possible.

Researcher will responsible for confidentiality regarding any responses in these questionnaires. Also, you have all the rights to participate or do not want to participate in this study. For questions or further details, kindly contact the investigator. Thank you for your kind attention.

Principle investigator : Syarifah Aqilah, S.Gz
Email : 6274017853@student.chula.ac.th
Phone / WhatsApp : +66 647593174

GENERAL CHARACTERISTICS

Item	Response
1. Name of school	2. Type of school
3. Grade	4. Major
5. Phone / email	6. Date of birth
7. Mother's highest education: a) Primary school b) Junior high school c) Senior high school d) Diploma e) Bachelor f) Master g) PhD	8. Father's highest education: a) Primary school b) Junior high school c) Senior high school d) Diploma e) Bachelor f) Master g) PhD
9. Weekly stipend (IDR)	10. Weight (kg) / Height (m)
Dietary habit	
1. How many times you have meal in a day?	2. How many times you have breakfast in a week?

Name:
Hereby, I declare willingly to participate as a respondent in the research. Every response that I gave are correct and I was under my parent's supervision during its completion.

Physical activity – PHYSICAL ACTIVITY QUESTIONNAIRE (HIGH SCHOOL)

We are trying to find out about your level of physical activity from *the last 7 days* (in the last week). This includes sports or dance that make you sweat or make your legs feel tired, or games that make you breathe hard, like tag, skipping, running, climbing, and others.

Remember:

1. There are no right and wrong answers — this is not a test.
2. Please answer all the questions as honestly and accurately as you can — this is very important.

1 Physical activity in your spare time: Have you done any of the following activities in the past 7 days (last week)? If yes, how many times? *Mark only one box per row.*

	No	1-2	3-4	5-6	7 times or more
Skipping					
Bicycling					
Jogging					
Running					
Swimming					
Football					
Badminton					
Soccer					
Volleyball					
Basketball					

2 In the last 7 days, during your physical education (PE) classes, how often were you very active (playing hard, running, jumping, throwing)? *Check one only.*

I don't do PE	
Hardly ever	
Sometimes	
Quite often	
Always	

3 In the last 7 days, what did you normally do *at lunch* (besides eating lunch)? *Check one only.*

Sat down (talking, reading, doing schoolwork)	
Stood around or walked around	
Ran or played a little bit	
Ran around and played quite a bit	
Ran and played hard most of the time	

4 In the last 7 days, on how many days *right after school*, did you do sports, dance, or play games in which you were very active? *Check one only.*

None	
1 time last week	
2 or 3 times last week	
4 times last week	
5 times last week	

5 In the last 7 days, on how many <u>evenings</u> did you do sports, dance, or play games in which you were very active? *Check one only.*

None	
1 time last week	
2 or 3 times last week	
4 or 5 times last week	
6 or 7 times last week	

6 *On the last weekend*, how many times did you do sports, dance, or play games in which you were very active? *Check one only.*

None	
1 time	
2 — 3 times	
4 — 5 times	
6 or more times	
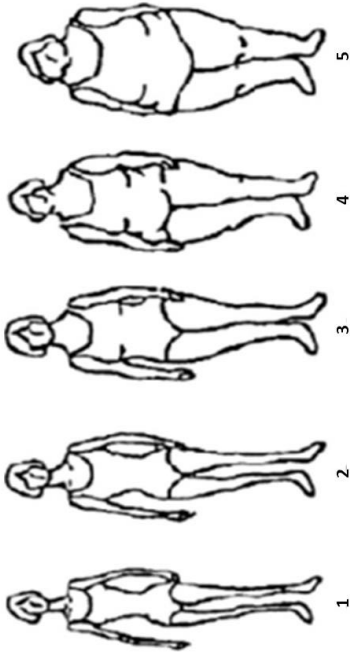
MASS MEDIA ENGAGEMENT

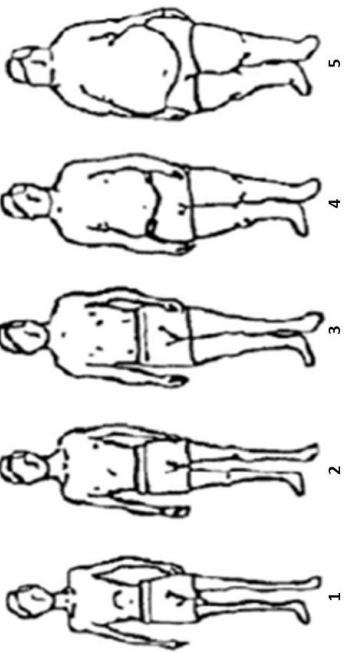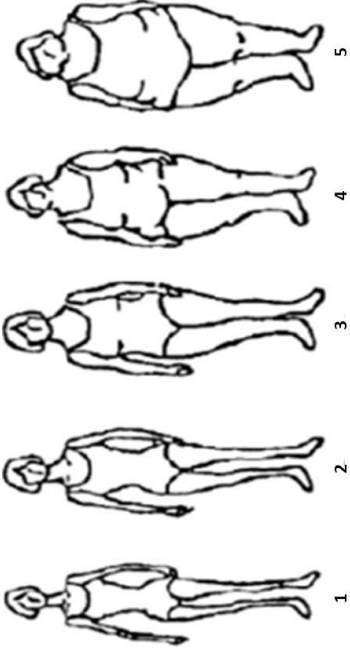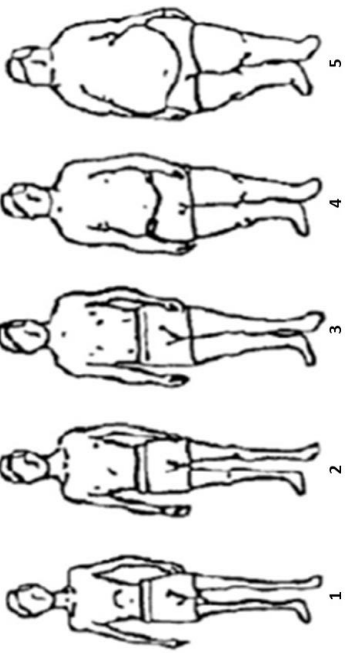|	Item
1.	What are the medias you ever access related to foods? (you can give more than one response) Book / Magazine / Newspaper / Social media / Television / Online news / Youtube / online video/ Other, please specify ......
2.	How many times you access those medias which related to foods in a week? ....
3.	Which personnel that you consider as the key provider of food-related information? a) Researchers, b) Celebrities, c) Health workers
4.	Are you joining a club related to food? ...... (e.g cooking club, food /menu development club, etc.)
5.	Do you have any experience attending food exhibition, cooking demo, or any common event related to food? ......

7	**Which one of the following describes you best for the last 7 days?** Read *all five* statements before deciding on the *one* answer that describes you.
A	All or most of my free time was spent doing things that involve little physical effort
B	I sometimes (1 — 2 times last week) did physical things in my free time (e.g. played sports, went running, swimming, bike riding, did aerobics)
C	I often (3 — 4 times last week) did physical things in my free time
D	I quite often (5 — 6 times last week) did physical things in my free time
E	I very often (7 or more times last week) did physical things in my free time

8	**Mark how often you did physical activity (like playing sports, games, doing dance, or any other physical activity) for each day last week.**

	No	Little bit	Medium	Often	Very often
Monday					
Tuesday					
Wednesday					
Thursday					
Friday					
Saturday					
Sunday					

9	**Were you sick last week, or did anything prevent you from doing your normal physical activities?** *Check one.*

Yes	
No	

If Yes, what prevented you? _____

BODY IMAGE PERCEPTION

Please choose one response only for each question.

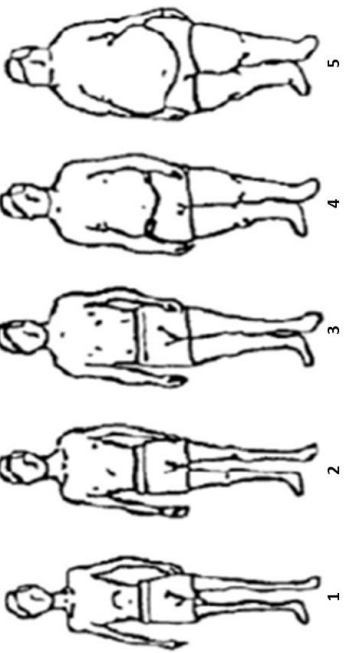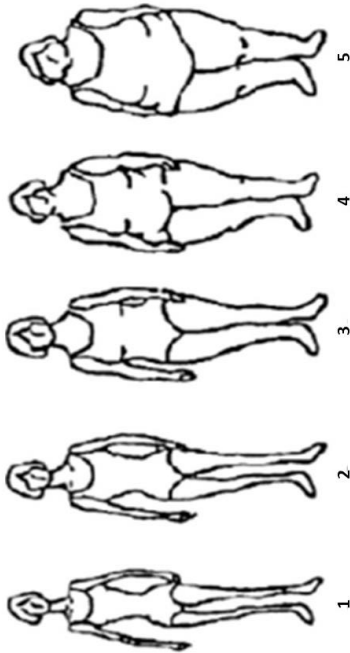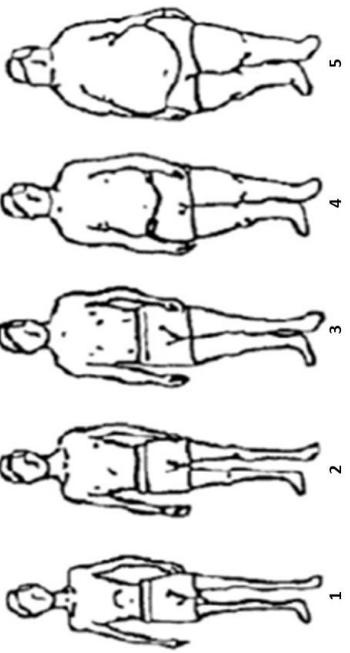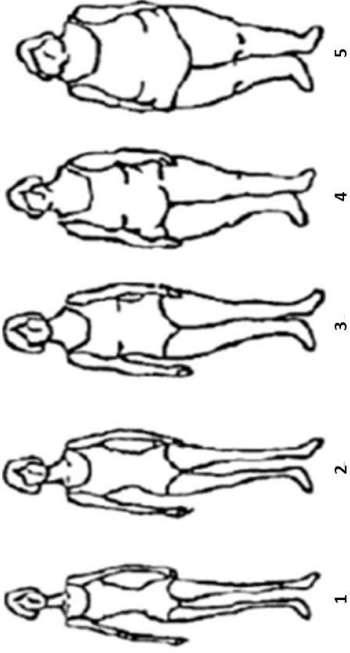| Item for female student |
|---|
| 1. Which figure is closely representing your body? |
| |
| Figure 1 / figure 2 / figure 3 / figure 4 / figure 5 |
| 2. Which figure is your favorite? |
| |
| Figure 1 / figure 2 / figure 3 / figure 4 / figure 5 |

BODY IMAGE PERCEPTION

Please choose one response only for each question

Item for male student
1. Which figure is closely representing your body?
Figure 1 / figure 2 / figure 3 / figure 4 / figure 5
2. Which figure is your favorite?
Figure 1 / figure 2 / figure 3 / figure 4 / figure 5

NUTRITION KNOWLEDGE QUESTIONNAIRE

Please choose one response only for each question.

No	Item
1	Which one of these following diseases is related to how much sugar people eat? ☐ High blood pressure ☐ Diabetes ☐ Anemia
2	Which one of these following diseases is related to how much salt (or sodium) people eat? ☐ High blood pressure ☐ Diabetes ☐ Anemia
3	Which one of these options do experts recommend to prevent heart disease? ☐ Eating less vegetables ☐ Eating less oily fish ☐ Eating less trans-fats
4	Which of these options do experts recommend to prevent diabetes? ☐ Eating more vegetables ☐ Drinking more fruit juice ☐ Eating more processed meat
5	If an adult has a Body Mass Index (BMI) of 23kg/m², what would their weight status be? ☐ Underweight ☐ Normal ☐ Overweight ☐ Obese

No	Item
6	Which one of the following cooking methods requires least fat to be added? ☐ Grilling ☐ Steaming ☐ Baking ☐ Sautéing
7	How many times per week do experts recommend that people should eat breakfast? ☐ 3 times ☐ 5 times ☐ 7 times
8	How much do experts recommend to limit oil consumption in a day? ☐ 1 teaspoon ☐ 4 tablespoons ☐ 5 tablespoons
9	How much do experts recommend to limit sugar consumption in a day? ☐ 1 teaspoon ☐ 4 tablespoons ☐ 5 tablespoons
10	How much do experts recommend to limit salt consumption in a day? ☐ 1 teaspoon ☐ 4 tablespoons ☐ 5 tablespoons

Item		
Do you think that these foods are typically high or low in fibre?		
	High in fibre	Low in fibre
11. Oats		
12. White rice		
13. Eggs		
14. Pineapple		
15. Pasta		

Item		
Do you think that these foods are a good source of protein?		
	yes	no
16. Poultry		
17. Butter		
18. Nuts		

Item		
Which one of the following foods do experts count as a source of carbohydrate?		
	yes	no
19. Cheese		
20. Pasta		
21. Potatoes		

'Isi Piringku' above shows the proportions of food types that people should eat in one meal. Match these following food types with the correct number.

Item		
	1 or 4	2 or 3
22. Starch		
23. Fish / meat / poultry / nuts		
24. Vegetables		
25. Fruit		

Note: This nutrition knowledge questionnaire consisted three uncounted questions for scoring due to low reliability value. They were item no. 11, 23, and 24. These questions are included considering understandable question flow.

Item
kindly refer to these two-figures for answering question number 26-28.

Informasi Nilai Gizi
Takaran saji 1 bungkus (91 g)
Jumlah sajian per kemasan1

Jumlah Per Sajian
Energi total 420 Kkal   Energi dari lemak 144 Kkal

		% AKG*
Lemak Total	16g	25%
Lemak Jenuh	8g	40%
Lemak Trans	0g	
Kolesterol	0mg	0%
Natrium/Sodium	1040mg	43%
Karbohidrat Total	60g	20%
Serat Pangan	8g	32%
Gula	7g	
Protein	8g	16%
Vitamin A		55%
Vitamin C		0%
Kalsium		4%
Zat Besi		35%

*Persen AKG berdasarkan kebutuhan energi 2000 Kkal. Kebutuhan energi anda mungkin lebih tinggi atau lebih rendah.

Gambar 1

INFORMASI NILAI GIZI / NUTRITION FACTS

Takaran Saji / Serving Size : 28 g
Jumlah Sajian per Kemasan / Serving per Container : 6

Jumlah Per Saji / Amount Per Serving
Energi Total / Calories   :140 kkal / 140 kcal
Energi dari Lemak / Calories from Fat : 60 kkal / 60 kcal

		%AKG	**%DV**
Lemak Total / Total Fat	7g	11%	
Lemak Jenuh / Saturated Fat	1.5 g	7%	
Kolesterol / Cholesterol	0 mg	0%	
Protein / Protein	2 g	4%	
Karbohidrat Total / Total Carbohydrate	18 g	6%	
Serat Pangan / Dietary Fiber	3 g	12%	
Gula / Sugars	1g		
Natrium / Sodium	15 mg	3%	

* Persen AKG berdasarkan kebutuhan energi 2000 kcal. Kebutuhan energi anda mungkin lebih tinggi atau lebih rendah tergantung kebutuhan kalori Anda.

* Percent Daily Value is based on 2,000 calorie diet. Your Daily Value may be higher or lower depending on your calorie needs.

Gambar 2

26. Which one of those food products have a higher energy per serving size?
☐ Figure 1
☐ Figure 2

27. Which one of those food products have a higher fiber per serving size?
☐ Figure 1
☐ Figure 2

28. Which one of those food products have a higher energy per container?
☐ Figure 1
☐ Figure 2

FOOD CHOICE QUESTIONNAIRE

Please tick only one response for each question.

It is important to me that the food I eat on a typical day:	Not important at all	A little important	Important	Very important
1	is easy to prepare				
2	contains no additives				
3	is low in calories				
4	tastes good				
5	contains natural ingredients				
6	is not expensive				
7	is low in fat				
8	Is familiar to me				
9	is high in fibre				
10	is nutritious				
11	is easily available in shops and supermarkets				
12	is good value for money				
13	Cheers me up				
14	smells nice				
15	Helps me cope with stress				
16	helps me control my weight				
17	has a pleasant texture				
18	Is like the food I ate when I was a child				

It is important to me that the food I eat on a typical day:	Not important at all	A little important	Important	Very important
19	Keeps me healthy				
20	contains lots of vitamins and minerals				
21	contains no artificial ingredients				
22	Keeps me awake and alert				
23	looks nice				
24	Helps me relax				
25	is high in protein				
26	takes no time to prepare				
27	is good for my skin/teeth/hair/nails etc.				
28	Makes me feel good				
29	Is what I usually eat				
30	can be bought in shops close to where I live or work				
31	is cheap				
32	Is not forbidden in my religion				
33	Is in harmony with my religious views				

3. Ethical approval

KOMITE ETIK PENELITIAN KESEHATAN
HEALTH RESEARCH ETHICS COMMITTEE
FAKULTAS KESEHATAN MASYARAKAT UNIVERSITAS MUHAMMADIYAH JAKARTA
FAKULTAS KESEHATAN MASYARAKAT UNIVERSITAS MUHAMMADIYAH JAKARTA

KETERANGAN LAYAK ETIK
DESCRIPTION OF ETHICAL APPROVAL
"ETHICAL APPROVAL"

No.10.003.B/KEPK-FKMUMJ/IV/2020

Protokol penelitian yang diusulkan oleh :
The research protocol proposed by

Peneliti utama   : SYARIFAH AQILAH, S.GZ
Principal In Investigator

Nama Institusi   : College of Public Health Sciences,
                                 Chulalongkorn University
Name of the Institution

Dengan judul:
Title

"Faktor-faktor yang berhubungan dengan Pemilihan Makanan (food choice) pada siswa SMA di Depok, Indonesia."

"Factors associated with Food Choice among high school students in Depok, Indonesia."

Dinyatakan layak etik sesuai 7 (tujuh) Standar WHO 2011, yaitu 1) Nilai Sosial, 2) Nilai Ilmiah, 3) Pemerataan Beban dan Manfaat, 4) Risiko, 5) Bujukan/Eksploitasi, 6) Kerahasiaan dan Privacy, dan 7) Persetujuan Setelah Penjelasan, yang merujuk pada Pedoman CIOMS 2016. Hal ini seperti yang ditunjukkan oleh terpenuhinya indikator setiap standar.

Declared to be ethically appropriate in accordance to 7 (seven) WHO 2011 Standards, 1) Social Values, 2) Scientific Values, 3) Equitable Assessment and Benefits, 4) Risks, 5) Persuasion/Exploitation, 6) Confidentiality and Privacy, and 7) Informed Concent, referring to the 2016 CIOMS Guidelines. This is as indicated by the fulfillment of the indicators of each standard.

Pernyataan Laik Etik ini berlaku selama kurun waktu tanggal 17 April 2020 sampai dengan tanggal 17 April 2021.

This declaration of ethics applies during the period April 17, 2020 until April 17, 2021.

April 17, 2020
Professor and Chairperson,

Dadang Herdansyah, SKM, M.Epid.

4. Indonesia Anthropometric Nutritional Assessment Standard for Children, 2011

B. Kategori dan Ambang Batas Status Gizi Anak

Kategori dan ambang batas status gizi anak adalah sebagai mana terdapat pada tabel di bawah ini:

Kategori dan Ambang Batas Status Gizi Anak Berdasarkan Indeks

Indeks	Kategori Status Gizi	Ambang Batas (Z-Score)
Berat Badan menurut Umur (BB/U) Anak Umur 0 – 60 Bulan	Gizi Buruk	< -3 SD
	Gizi Kurang	-3 SD sampai dengan < -2 SD
	Gizi Baik	-2 SD sampai dengan 2 SD
	Gizi Lebih	>2 SD
Panjang Badan menurut Umur (PB/U) atau Tinggi Badan menurut Umur (TB/U) Anak Umur 0 – 60 Bulan	Sangat Pendek	< -3 SD
	Pendek	-3 SD sampai dengan < -2 SD
	Normal	-2 SD sampai dengan 2 SD
	Tinggi	>2 SD
Berat Badan menurut Panjang Badan (BB/PB) atau Berat Badan menurut Tinggi Badan (BB/TB) Anak Umur 0 – 60 Bulan	Sangat Kurus	< -3 SD
	Kurus	-3 SD sampai dengan < -2 SD
	Normal	-2 SD sampai dengan 2 SD
	Gemuk	>2 SD
Indeks Massa Tubuh menurut Umur (IMT/U) Anak Umur 0 – 60 Bulan	Sangat Kurus	< -3 SD
	Kurus	-3 SD sampai dengan < -2 SD
	Normal	-2 SD sampai dengan 2 SD
	Gemuk	>2 SD
Indeks Massa Tubuh menurut Umur (IMT/U) Anak Umur 5 – 18 Tahun	Sangat Kurus	< -3 SD
	Kurus	-3 SD sampai dengan < -2 SD
	Normal	-2 SD sampai dengan 1 SD
	Gemuk	>1 SD sampai dengan 2 SD
	Obesitas	>2 SD

MENTERI KESEHATAN RI,

ENDANG RAHAYU SEDYANINGSIH

641.1
Ind
k

KEPUTUSAN MENTERI KESEHATAN REPUBLIK INDONESIA

NOMOR : 1995/MENKES/SK/XII/2010

TENTANG

STANDAR ANTROPOMETRI PENILAIAN STATUS GIZI ANAK

KEMENTERIAN KESEHATAN RI
DIREKTORAT JENDERAL BINA GIZI DAN KESEHATAN IBU DAN ANAK
DIREKTORAT BINA GIZI
2011

5. Timeline

Activities	2019				2020						
	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul
	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4
Literature review	■■■■	■■■■	■■■■	■■■■	■■■■	■■					
Writing proposal			■■■	■■■■	■■■■						
Proposal examination						■					
Instrument validation & ethical review							■■■	■■			
Data collection								■■	■■		
Data analysis									■■	■■	
Writing full report										■■■	
Writing manuscript										■■■	
Thesis examination & revision											■■■

6. Budget

No	Item	Price (THB)	Quantity	Total
1	Ethical review fee	1,200	1	1,200
2	Research assistant	3,000	3	9,000
3	Souvenir for key participants	40	50	2,000
			Total	12,200

REFERENCES

Keputusan Menteri Kesehatan Republik Indonesia Nomor: 1995/MENKES/SK/XII/2010 tentang Standar Antropometri Penilaian Status Gizi Anak, (2011).

Anetta, B. (2018). Millennial consumers in the convenience food market. *Management, 22*(1), 251-264. doi:https://doi.org/10.2478/manment-2018-0018

Badan Penelitian dan Pengembangan Masyarakat, K. K. R. (2013). *Riset Kesehatan Dasar RISKESDAS 2013*. Retrieved from Jakarta:

Badan Penelitian dan Pengembangan Masyarakat, K. K. R. (2018). *Laporan Nasional RISKESDAS 2018*. Retrieved from Jakarta:

Baliwati, Y. F., Khomsan, A., & Dwiriani, C. M. J. J. P. S. (2004). Pengantar pangan dan gizi. *32*.

Barat, D. K. P. J. (2017). *Profil Kesehatan* Bandung: Dinas Kesehatan Provinsi Jawa Barat.

Barbara G. Tabachnick, & Fidell, L. S. (2007). *Using Multivariate Statistics*. United State of America: Pearson Education. Inc.

Benedict, R. K., Schmale, A., & Namaste, S. (2018). *DHS Comparative Report Adolescent Nutrition 2000-2017: DHS Data on Adolescents Age 15-19*. Retrieved from USA:

Benítez-Porres, J., Alvero-Cruz, J. R., Sardinha, L. B., López-Fernández, I., & Carnero, E. A. (2016). Cut-off values for classifying active children and adolescentes using the Physical Activity Questionnaire: PAQ-C and PAQ-ACut-off values for classifying active children and adolescents using the Physical Activity Questionnaire: PAQ-C and PAQ-A. *Nutricion hospitalaria, 33*(5), 564. http://europepmc.org/abstract/MED/27759968

https://doi.org/10.20960/nh.564 doi:10.20960/nh.564

Bibiloni, M. d. M., Pich, J., Pons, A., & Tur, J. A. (2013). Body image and eating patterns among adolescents. *BMC Public Health, 13*(1), 1104. doi:10.1186/1471-2458-13-1104

Brown, J. E., Isaacs, J. S., Krinke, U. B., Lechtenberg, E., Murtaugh, M. A., Sharbaugh, C., . . . Wooldridge, N. H. (2011). *Nutrition Through the Life Cycle, Fourth Edition*. Belmont: Wadsworth.

Bruce, A. S., Pruitt, S. W., Ha, O.-R., Cherry, J. B. C., Smith, T. R., Bruce, J. M., & Lim, S.-L. (2016). The Influence of Televised Food Commercials on Children's Food Choices: Evidence from Ventromedial Prefrontal Cortex Activations. *The Journal of Pediatrics, 177*, 27-32.e21. doi:https://doi.org/10.1016/j.jpeds.2016.06.067

Canales, P., & Hernández, A. (2016). Nutrition among Adolescent Spaniards: Healthy and Non-healthy Motives of Food Choice. *Journal of Food and Nutrition Research, 4*(3), 178-184. doi:10.12691/jfnr-4-3-8

Contento, I. R., Basch, C., & Zybert, P. (2003). Body Image, Weight, and Food Choices of Latina Women and Their Young Children. *Journal of Nutrition Education and Behavior, 35*(5), 236-248. doi:https://doi.org/10.1016/S1499-4046(06)60054-7

Cunha, L. M., Cabral, D., Moura, A. P., & de Almeida, M. D. V. (2018). Application of the Food Choice Questionnaire across cultures: Systematic review of cross-

cultural and single country studies. *Food Quality and Preference, 64*, 21-36. doi:https://doi.org/10.1016/j.foodqual.2017.10.007

Erdenebileg, Z., Park, S., & Chang, K. (2018). Comparison of body image perception, nutrition knowledge, dietary attitudes, and dietary habits between Korean and Mongolian college students. *Nutrition Research and Practice, 12*, 149. doi:10.4162/nrp.2018.12.2.149

Gaylis, J. B., Levy, S. S., & Hong, M. Y. (2019). Relationships between body weight perception, body mass index, physical activity, and food choices in Southern California male and female adolescents. *International Journal of Adolescence and Youth*, 1-12. doi:10.1080/02673843.2019.1614465

Gomez-Lopez, I. N., Clarke, P., Hill, A. B., Romero, D. M., Goodspeed, R., Berrocal, V. J., . . . Veinot, T. C. (2017). Using Social Media to Identify Sources of Healthy Food in Urban Neighborhoods. *Journal of Urban Health, 94*(3), 429-436. doi:10.1007/s11524-017-0154-1

Grogan, S. (2017). *BODY IMAGE Understanding body dissatisfaction in men, women and children.*

Third Edition. New York: Routledge.

Hayes, J. F., Giles, G. E., Mahoney, C. R., & Kanarek, R. B. (2018). Breakfast food health and acute exercise: Effects on state body image. *Eating Behaviors, 30*, 22-27. doi:https://doi.org/10.1016/j.eatbeh.2018.05.006

Ilich, J. Z., Vollono, J. A., & Brownbill, R. A. (1999). Impact of Nutritional Knowledge on Food Choices and Dietary Intake of College Students. *Journal of the American Dietetic Association, 99*(9, Supplement), A89. doi:https://doi.org/10.1016/S0002-8223(99)00707-5

Improving America's Diet and Health: From Recommendations to Action. (1991). (P. R. Thomas Ed.). Washington DC: National Academies Press.

Kaewpradub, N., Kiatrungrit, K., Hongsanguansri, S., & Pavasuthipaisit, C. (2017). Association Among Internet Usage, Body Image and Eating Behaviors of Secondary School Students. *Shanghai archives of psychiatry, 29*(4), 208-217. doi:10.11919/j.issn.1002-0829.216092

Kliemann, N., Wardle, J., Johnson, F., & Croker, H. (2016). Reliability and validity of a revised version of the General Nutrition Knowledge Questionnaire. *Eur J Clin Nutr, 70*(10), 1174-1180. doi:10.1038/ejcn.2016.87

Kowalski, K. C., Crocker, P. R., & Donen, R. M. (2004). The Physical Activity Questionnaire for Older Children (PAQ-C) and Adolescents (PAQ-A) Manual.

Lindeman, M., & Stark, K. (1999). Pleasure, Pursuit of Health or Negotiation of Identity? Personality Correlates of Food Choice Motives Among Young and Middle-aged Women. *Appetite, 33*(1), 141-161. doi:https://doi.org/10.1006/appe.1999.0241

Lindeman, M., & Väänänen, M. (2000). Measurement of Ethical Food Choice Motives. *Appetite, 34*, 55-59. doi:10.1006/appe.1999.0293

Lowry, R., Galuska, D. A., Fulton, J. E., Wechsler, H., Kann, L., & Collins, J. L. (2000). Physical activity, food choice, and weight management goals and practices among U.S. college students. *American Journal of Preventive Medicine, 18*(1), 18-27. doi:https://doi.org/10.1016/S0749-3797(99)00107-5

Lusk, J. L. (2019). Income and (Ir) rational food choice. *Journal of Economic Behavior & Organization, 166*, 630-645. doi:https://doi.org/10.1016/j.jebo.2019.08.005

Marcus, J. B. (2013). Chapter 1 - Nutrition Basics: What Is Inside Food, How It Functions and Healthy Guidelines: The Nutrients in Foods and Beverages in Healthy Cooking and Baking. In J. B. Marcus (Ed.), *Culinary Nutrition* (pp. 1-50). San Diego: Academic Press.

Martinez-Gomez, D., Martinez-de-Haro, V., Pozo, T., Welk, G. J., Villagra, A., Calle, M. E., . . . Veiga, O. L. (2009). [Reliability and validity of the PAQ-A questionnaire to assess physical activity in Spanish adolescents]. *Rev Esp Salud Publica, 83*(3), 427-439. doi:10.1590/s1135-57272009000300008

Maulida, R., Nanishi, K., Green, J., Shibanuma, A., & Jimba, M. (2016). Food-choice motives of adolescents in Jakarta, Indonesia: the roles of gender and family income. *Public Health Nutrition, 19*(15), 2760-2768. doi:10.1017/S136898001600094X

Meah, A., & Jackson, P. (2017). Convenience as care: Culinary antinomies in practice. *Environment and Planning A: Economy and Space, 49*(9), 2065-2081. doi:10.1177/0308518X17717725

Meiselman, H. L., & Bell, R. (2003). EATING HABITS. In B. Caballero (Ed.), *Encyclopedia of Food Sciences and Nutrition (Second Edition)* (pp. 1963-1968). Oxford: Academic Press.

Miedema, B., Bowes, A., Hamilton, R., & Reading, S. (2016). Assessing the Efficacy of a Group Mediated Nutritional Knowledge Intervention for Individuals with Obesity. *Canadian Journal of Dietetic Practice and Research, 77*(4), 206-209. doi:10.3148/cjdpr-2016-022

Nutrition at a Glance. (2016). Oxford: John Wiley & Sons, Ltd.

A PRACTICAL INTRODUCTION TO FACTOR ANALYSIS.

Preventive Nutrition, the Comprehensive Guide for Health Professionals. (2005). (ADRIANNE BENDICH & R. J. DECKELBAUM Eds. third edition ed.). New Jersey: Humana Press Inc.

The psychology of food choice. (2006). (R. Sepherd & M. Raats Eds.). Oxfordshire: CABI.

Radwan, H., Hasan, H. A., Ismat, H., Hakim, H., Khalid, H., Al-Fityani, L., . . . health, p. (2019). Body Mass Index Perception, Body Image Dissatisfaction and Their Relations with Weight-Related Behaviors among University Students. *International journal of environmental research and public health, 16*(9), 1541.

Raggatt, M., Wright, C. J. C., Carrotte, E., Jenkinson, R., Mulgrew, K., Prichard, I., & Lim, M. S. C. (2018). "I aspire to look and feel healthy like the posts convey": engagement with fitness inspiration on social media and perceptions of its influence on health and wellbeing. *BMC Public Health, 18*(1), 1002. doi:10.1186/s12889-018-5930-7

Rhodes, R. E., Janssen, I., Bredin, S. S. D., Warburton, D. E. R., & Bauman, A. (2017). Physical activity: Health impact, prevalence, correlates and interventions. *Psychology & Health, 32*(8), 942-975. doi:10.1080/08870446.2017.1325486

Rogers, P. J. (2001). A healthy body, a healthy mind: long-term impact of diet on mood and cognitive function. *Proceedings of the Nutrition Society, 60*(1), 135-143. doi:10.1079/PNS200061

Rozin, P. (2007). 1 - Food choice: an introduction. In L. Frewer & H. van Trijp (Eds.), *Understanding Consumers of Food Products* (pp. 3-29): Woodhead Publishing.

Saunders, T. J., Gray, C. E., Poitras, V. J., Chaput, J.-P., Janssen, I., Katzmarzyk, P. T., .

. . Carson, V. (2016). Combinations of physical activity, sedentary behaviour and sleep: relationships with health indicators in school-aged children and youth. *Applied Physiology, Nutrition, and Metabolism, 41*(6 (Suppl. 3)), S283-S293. doi:10.1139/apnm-2015-0626

Scully, M., Wakefield, M., Niven, P., Chapman, K., Crawford, D., Pratt, I. S., . . . Morley, B. (2012). Association between food marketing exposure and adolescents' food choices and eating behaviors. *Appetite, 58*(1), 1-5. doi:https://doi.org/10.1016/j.appet.2011.09.020

Share, M., & Stewart-Knox, B. (2012a). Determinants of food choice in Irish adolescents. *Food Quality and Preference, 25*(1), 57-62. doi:https://doi.org/10.1016/j.foodqual.2011.12.005

Share, M., & Stewart-Knox, B. (2012b). Determinants of food choice in Irish adolescents. *Food Quality and Preference, 25*, 57–62.

Steptoe, A., Pollard, T. M., & Wardle, J. (1995). Development of a Measure of the Motives Underlying the Selection of Food: the Food Choice Questionnaire. *Appetite, 25*(3), 267-284. doi:https://doi.org/10.1006/appe.1995.0061

Stroebele, N., & De Castro, J. M. (2004). Effect of ambience on food intake and food choice. *Nutrition, 20*(9), 821-838. doi:https://doi.org/10.1016/j.nut.2004.05.012

Taber, K. S. (2018). The Use of Cronbach's Alpha When Developing and Reporting Research Instruments in Science Education. *Research in Science Education, 48*(6), 1273-1296. doi:10.1007/s11165-016-9602-2

Tarabashkina, L., Quester, P., & Crouch, R. (2016). Exploring the moderating effect of children's nutritional knowledge on the relationship between product evaluations and food choice. *Social Science & Medicine, 149*, 145-152. doi:https://doi.org/10.1016/j.socscimed.2015.11.046

Tenfold increase in childhood and adolescent obesity in four decades: new study by Imperial College London and WHO. (11 October 2017).

Tsang, S., Royse, C. F., & Terkawi, A. S. (2017). Guidelines for developing, translating, and validating a questionnaire in perioperative and pain medicine. *Saudi journal of anaesthesia, 11*(Suppl 1), S80-S89. doi:10.4103/sja.SJA_203_17

Wardlaw, G. M., & Hampl, J. S. (2007). *Perspective in Nutrition, Seventh Edition*. New York: McGraw-Hill.

Wardle, J., Haase, A. M., Steptoe, A., Nillapun, M., Jonwutiwes, K., & Bellisie, F. (2004). Gender differences in food choice: The contribution of health beliefs and dieting. *Annals of Behavioral Medicine, 27*(2), 107-116. doi:10.1207/s15324796abm2702_5

Whitney, E., & Rolfes, S. R. (2008). *Understanding Nutrition, Eleventh Edition*. Belmont: Thomson Wadsworth.

Yahia, N., Brown, C. A., Rapley, M., & Chung, M. (2016). Level of nutrition knowledge and its association with fat consumption among college students. *BMC Public Health, 16*(1), 1047. doi:10.1186/s12889-016-3728-z

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