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Editorial Team

Sinisha Stojanovski, MD, PhD. Medical Faculty, Saints Cyril and Methodius University in Skopje, Skopje, Republic of Macedonia
sinisa.stojanoski@hotmail.com
ORCID iD: https://orcid.org/0000-0002-4967-2102
Web of Science ResearcherID: AFL-9514-2022
Scopus Author ID: 6504203064

Filip Koneski, Doctor of Dental Medicine, MSc. University Clinic for Maxillofacial Surgery in Skopje, Ss. Cyril and Methodius University in Skopje, Faculty of Dental Medicine, Skopje, Republic of Macedonia
dr.koneski@gmail.com
ORCID iD: https://orcid.org/0000-0003-2412-7594
Web of Science ResearcherID: J-9194-2019
Scopus Author ID: 57073856400

Aleksandar Iliev, Doctor of Dental Medicine, PhD. Department of Maxillofacial Surgery, Faculty of Dentistry , The Saints Cyril and Methodius University of Skopje, Skopje, Republic of Macedonia
aleksandar.iliev@gmail.com
ORCID iD: https://orcid.org/0000-0001-5348-9143
Web of Science ResearcherID: ACV-7553-2022
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Nutrition Education 4.0 to Prevent Overweight and Obesity through Social Media

Trias Mahmudiono[1,2]*, Su Peng Loh[3], Dominikus Raditya Atmaka[1], Qonita Rachmah[1], Mahmudah Mahmudah[4], Shintia Yunita Arini[5], Mutiara Arsya Vidianinggar[1], Ratih Wirapuspita Wisnuwardani[6], Kadek Tresna Adhi[7], Nila Reswari Haryana[8], Setyo Utami Wisnusanti[9], Windi Indah[10], Nikmah Utami Dewi[11]

[1]Department of Nutrition, Faculty of Public Health, Universitas Airlangga, Surabaya, Indonesia; [2]Center for Health and Nutrition Education, Counseling and Empowerment (CHeNECE), Airlangga, Surabaya, Indonesia; [3]Department of Epidemiology, Biostatistics and Health Promotion, Faculty of Public Health, Universitas Airlangga, Surabaya, Indonesia; [4]Department of Occupational Health and Safety, Faculty of Public Health, Universitas Airlangga, Surabaya, Indonesia; [5]Department of Public Health, Faculty of Public Health, Universitas Mulawarman, Samarinda, Indonesia; [6]Department of Public Health, Faculty of Medicine, Universitas Udayana, Kuta Selatan, Indonesia; [7]Department of Nutrition, Faculty of Public Health, Universitas Negeri, Medan, Indonesia; [8]Department of Nutrition, Faculty of Medicine, Public Health and Nursing, Universitas Gadjah Mada, Yogyakarta, Indonesia; [9]Department of Nutrition, Faculty of Public Health, Universitas Sriwijaya, Palembang, Indonesia; [10]Department of Nutrition, Faculty of Public Health, Universitas Tadulako, Palu, Indonesia

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***Correspondence:** Trias Mahmudiono, Department of Nutrition, Faculty of Public Health, Universitas Airlangga, Surabaya, Indonesia. E-mail: trias-m@fkm.unair.ac.id
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Abstract

INTRODUCTION: This study was aimed explore the effectiveness of 2 months online-based nutrition education related to reduction of obesity and the risk factor of overweight in adulthood aged 17–25 years compared to the control group. The nutrition education was followed by 800 participants who consist of intervention and control group. The intervention group was given pre-test and post-test each module, on the other hand, control groups only had to join webinar nutrition education.

MATERIALS AND METHOD: Eight hundred early adulthood participants coming from various regions in Indonesia were invited to join WhatsApp group to get intervention by modules and webinar in different topic about nutrition. This is a randomized control trial study by giving nutrition education modules to adults. This study targets adult aged 17–25 years using a quasi-experiment design with a pre- and post-test control group design. The study will be conducted online in eight urban areas (center) in Indonesia, namely: Surabaya, Yogyakarta, Jember, Medan, Bali, Samarinda, Kupang, and Palu City.

Introduction

Background

The total number of active social media users in Indonesia in 2020 is 160 million users and 99% of them access social media through mobile phones. The average use of social media in a day is 3 h 26 min. The most widely used social media platforms in Indonesia in 2020 are YouTube, WhatsApp, Facebook, Instagram, and Twitter. Based on profiles of viewer ads from the platforms Facebook, Instagram, and FB Messenger, 30.3% came from the 18 to 24 year age group and 35.4% came from the 25 to 24 year age group [1], [2].

About 87.3% of users aged 17–24 years use online food delivery applications. In the 17–24 year age group, 30.7% used online delivery applications 1 time a month, 42.5% used 1 time every 1–2 weeks, and 26.7% used more than 1 time/week. About 75.1% use the food delivery feature from Gojek and 16.9% use the Grab application [3].

Obesity is one of the nutritional problems that are increasing from year to year in Indonesia. The prevalence of obesity in Indonesia according to Riskesdas 2018 shows that 13.6% of adults aged >18 years are overweight while 21.8% are obese [4]. Several comorbidities associated with overweight and obesity includes cancer, type 2 diabetes mellitus, hypertension, stroke, coronary heart disease, and

other non-communicable diseases [1], [5]. Therefore, it is necessary to intervene to overcome the problem of obesity so that it does not become a problem and a burden on the country's health in the future.

Young adulthood is a stage where there is a life transition from adolescence, increasing independence, increasing autonomy in food choices, physical activity, and the development of cooking skills. One of the challenges in this phase of life is how to influence and encourage young adults to adopt healthy eating behaviors [3], [6]. The high use of social media platforms allows young adults to get a lot of information about nutrition and health from social media [7]. Therefore, one way that can be done to increase knowledge, attitudes, and behavior toward eating habits is to provide nutrition education through social media.

The purpose of this research is to increase knowledge, attitudes, and behavior toward the habit of ordering food online, nutrient-dense food and energy-dense food, food safety, physical activity, sugar-sweetened beverage, as well as intake of energy, protein, fat, and fiber through social media platforms that are widely used by the target.

This research roadmap is in line with the pillars of public health, namely, health promotion (Health Promotion) and public health nutrition (Public Health Nutrition) to improve public health status. The development of research on public health nutrition is directed at the healthy-risk-problem range of nutrition. The form of nutritional problems in this study is over nutrition which consists of overweight and obesity problems. The main focus in research on over nutrition is how to make adolescents and young adults know, want, and be able to improve their own health status and prevent overweight and obesity. Providing education through a platform that is close to adolescents and young adults is expected to increase knowledge, attitudes, and behavior in preventing overweight and obesity.

Study objective

The aims of the study are to determine the effectiveness of 2 months (three meetings) online-based nutrition education related to reduction of obesity and the risk factor of overweight in adulthood aged 17–25 years compared to the control group.

The primary objective is to determine the effectiveness of 2 months (three meetings) online-based nutrition education related to reduction of obesity and the risk factor of overweight versus control group on adults' nutritional knowledge.

Primary hypothesis

Online-based nutrition education for 2 months associated with the food preference to reduction of obesity in adults compared to the control group.

Secondary objective

Adults' nutrition knowledge and health well-being

1. Determine adults' nutrition knowledge related to reduction of obesity and the risk factor of overweight compared to control group during 2 months (three meetings) of education
2. Determine adults' attitude toward food preference on ordering food online, nutrient-dense food and energy-dense food, food security, physical activity, sugar-sweetened beverage, also energy intake, protein, fat, and fiber during 2 months (three meetings) of education
3. Determine the physical activity and intake changes on adults during the COVID-19 pandemic.

Adult's knowledge changes

1. Measure mean delta change (total change of pre-test and post-test), comparing both intervention groups separately to control group, measured before and after education
2. Determine adults' food preference through pre-test and post-test, comparing both intervention and control groups, before and after education

Methods

Study design

This research was conducted using a quasi-experimental research design with a pre-test and post-test control group design approach. The use of this experimental design was carried out to measure the effectiveness of providing an intervention in the form of nutrition education to the respondents to be observed. Respondents will be divided into two groups, namely, the group that received the intervention (treatment) and the group that did not receive the intervention (control). The intervention group will be given education through social media while the non-intervention group will be given an educational soft file in the form of a pdf.

Participant selection and enrollment

Subject is part of the number and characteristics possessed by a population. Subjects are part of the population whose number can be determined using certain methods and existing considerations. One way to calculate the number of subjects is to use Slovin's (1960) formula, as follows:

$$n = \frac{N}{1 + Ne^2}$$

$$n = \frac{3902}{1+[3902\ x\ (0,1^2)}$$

$$n = \frac{3902}{1+3902\ x\ (0,001)}$$

$$n = \frac{3902}{4,902}$$

n = 796 ≈ 800 people

It can be seen that:

n = Number of samples
N = Total population
e = Fault tolerance limit = 0.01

Based on the results of calculations using the Slovin formula, for this study, the results of the calculation of a minimum sample of 100 students for each PTN/PTS student include Airlangga University, Jember University, Gadjah Mada University, Udayana University, Mulawarman University, Medan State University, Tadulako University, and Kupang Health Polytechnic. Total research sample = 800 students.

Consenting participant

The participants will be informed about the purpose of the study, the procedures involved when participating, and asked for their consent. Informed consent will be in Indonesian and it also explains briefly about the study, purpose, duration, as well as rights and obligations of respondents. It will be explained to the participants that participation is voluntary and the respondent will be educated particularly by Modules Nutrition Education from the researcher. Participants will receive informed consent through online survey application.

Recruitment of participants

Due to the COVID-19 pandemic situation, offline recruitment is not possible, so it must be carried out online. The research team conducted several promotions with social media and contacted university directly in eight cities.

Randomization

Determination of the sample will be done by simple random sampling. This technique is used by sampling where all individuals in the population have the opportunity to be selected as sample members. In this study, the names of students who become the population will be collected, then simple random sampling is carried out by drawing lots to determine the names that will be the treatment group and control group.

Study site

Setting and number of participant

The study will be conducted online through modules nutrition education which shared on WhatsApp group in eight urban areas (center) in Indonesia, namely: Surabaya, Yogyakarta, Bali, Palu, Medan, Jember, Kupang, and Samarinda City. We will conduct a "Nutrition Education 4.0 to Prevent Overweight and Obesity Through Social Media" in these eight cities as a means to recruit adults to participate in this study. A total of 800 adults aged 17–25 years are joining in this research.

Inclusion criteria

Adults will be included if they meet all the following inclusion criteria:

1. 17–25 years of age
2. Adults majoring health education
3. Intending to follow the nutrition education of the 2 months follow-up
4. Have smartphone and social media.

Exclusion criteria

Adults were not experiencing metabolic disorder, eating disorder, and recovering from illness will not be included in this study.

Data collection and statistical analysis

Data will be collected through a pre- and post-test questionnaire and given to all participants (both for intervention and control group) online. All available data will be analyzed descriptively. Results will be summarized as frequencies and percentages for nominal data. Bivariate analysis was done using the Chi-square test with a nominal data scale. Results for bivariate analysis will be summarized as p-value and cross-tabulation table. Meanwhile, multivariate analysis was performed using logistic regression tests to determine which variable was the most dominant in influencing dependent variables. The results from the multivariate analysis will be summarized as p-value, odds ratio, and 95%-confidence interval. The normality test was analyzed using the Kolmogorov–Smirnov test. To analyze the effectiveness of online nutrition education, the ANOVA test will be conducted. All the statistical analyses before will be performed using IBM SPSS 25 software.

Intervention

Intervention allocation

The number of research samples was then divided into two groups, namely, the intervention

group (treatment) and the group that did not receive intervention (control). All students in this study will receive nutrition education materials about the habit of ordering food online, nutrient-dense food and energy-dense food, food safety, physical activity, sugar-sweetened beverage, and intake of energy, protein, fat, and fiber. The treatment group will receive education through social media for 3 months in the form of videos and pictures, while the control group will receive education through books in pdf format. The independent variable in this study was nutrition education. The dependent variable in this study is the subject's characteristics, knowledge, attitudes, and behavior of the subject toward the habit of ordering food online, nutrient-dense food and energy-dense food, food safety, physical activity, sugar-sweetened beverage, and intake of energy, protein, fat, and fiber.

Intervention group

In the intervention group, participants will get the nutrition education materials from Modules with different topics each week and webinar related nutrition. Baseline and endline for the control group will be conducted in weeks 0–3. The curriculum for the intervention group is stated in Table 1.

Table 1: Topics Intervention of Nutrition Education

Weeks	Topics
1	My Plate
2	Physical Activity
3	Breakfast
4	Fluid Intake
5	Traffic Light Diet
6	Sugar, Salt, and Fat Intake
7	Manifestation of Foods High to Low in Sugar, Salt, and Fat
8	Food Label
9	Popular Diet
10	Low Carb Diet
11	High Fat Diet
12	Calorie Restriction Diet
13	Healthy Diet

Control group

In the control group, participants will get webinar nutrition education. Baseline and endline for the control group will be conducted in weeks 0–1.

All groups will be given the written material through the Center for Health and Nutrition Education, Counseling and Empowerment Research Group's website and can be accessed from https://chenece-fkmunair.com/.

Feasibility

Study investigator and their roles

This study is a collaboration research between eight universities in Indonesia: Universitas Airlangga in Surabaya, Universitas Jember in Jember, Universitas Gadjah Mada in Yogyakarta, Universitas Udayana in Bali, Universitas Mulawarman in Samarinda, Universitas Negeri Medan in Medan, Universitas Tadulako in Palu, Poltekkes Kupang in Kupang. Each university has the responsibility to recruiting each center's respondent since we have eight different locations for nutrition education.

Study Organization

Coordination

A field research coordinator will be dedicated to ongoing supervision and monitoring of study implementation. Data collection will be monitored and evaluated regularly by the statistician. Principle investigator along with the field coordinator will also communicate regularly with the coinvestigator to make sure the implementation is going well.

Staff, training, and supervision

In this study, the researcher gives the nutrition education modules for adults.

Ethical consideration

The study will be performed in accordance with ethical principles that have their origin in the World Health Organization-Council for International Organizations of Medical Sciences. This study has already been considered by the Health Research Ethics Committee, Universitas Airlangga, Faculty of Public Health, Surabaya, Indonesia No.21/EA/KEPK/2021. Participants are recruited through the "Nutrition Education 4.0 to Prevent Overweight and Obesity Through Social Media" and given verbal and written information about this research. Furthermore, participants are given verbal and written informed consent by the researcher to fulfill the requirement. Participants may withdraw from this study anytime without negative consequences.

Acknowledgment

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