Single-session nutritionist-led counseling improves health self-efficacy among teachers

Lini Anisfatus Sholihah* Cleonara Yanuar Dini, Wildan Alfira Gusrianto, Salma Shafrina Aulia

Program Study of Nutrition, Faculty of Sport Sciences and Health, Universitas Negeri Surabaya, East Java, Indonesia

Correspondence: linisholihah@unesa.ac.id

ABSTRAK

Latar Belakang: Peningkatan prevalensi obesitas dan sindrom metabolik (MetS) di kalangan guru membutuhkan intervensi yang terarah untuk mencapai hasil yang diinginkan. Konseling yang dengan nutrisionis dapat meningkatkan efikasi diri terkait kesehatan pada kelompok sasaran dengan memberikan pengetahuan, keterampilan, dan kepercayaan diri untuk menjalani gaya hidup yang lebih sehat.
Tujuan: Penelitian ini bertujuan untuk mengevaluasi apakah intervensi konseling tatap muka satu kali dapat secara signifikan meningkatkan efikasi diri pada kalangan guru.
Metode: Studi eksperimental ini menggunakan desain pre-dan-post-test yang melibatkan 23 guru SMK (14 perempuan dan 9 laki-laki) yang berpartisipasi dalam sesi konseling selama tiga jam yang dilakukan dalam satu hari oleh nutrisionis terlatih. Sebelum intervensi, peserta menjalani pengukuran antropometri dan skrining risiko MetS. Efikasi diri dinilai menggunakan kuesioner tervalidasi sebelum dan sesudah konseling. Analisis statistik dilakukan menggunakan uji t-berpasangan serta uji chi-square atau Fisher's Exact.
Hasil: Temuan menunjukkan peningkatan signifikan pada skor efikasi diri dari rata-rata awal 26±2 menjadi 28±2 setelah intervensi ($p<0,001$). Proporsi guru yang dengan peningkatan kepercayaan diri dalam memilih makanan yang tepat berbeda secara signifikan sebelum dan sesudah intervensi ($p=0,02$). Prevalensi obesitas di kalangan peserta tinggi, dengan 57% dikategorikan obesitas berdasarkan Indeks Massa Tubuh (IMT).
Kesimpulan: Konseling gizi terarah dapat secara efektif meningkatkan efikasi diri pada kalangan guru, yang berpotensi meningkatkan kepercayaan diri dalam menjalani gaya hidup sehat dan mengurangi risiko MetS. Studi ini menekankan pentingnya mengintegrasikan intervensi konseling gizi oleh nutrisionis di lingkungan pendidikan untuk mempromosikan kesehatan di kalangan guru, yang berperan sebagai *role model* bagi siswa.

KATA KUNCI: *efikasi diri; guru; konseling gizi; obesitas; promosi kesehatan; sindrom metabolik (SMet).*

ABSTRACT

Background: *The increasing prevalence of obesity and metabolic syndrome (MetS) among teachers necessitates targeted interventions to enhance health outcomes. Nutritionist-led counseling can enhance health self-efficacy by equipping individuals with knowledge, skill, and confidence to have healthier lifestyles.*

Objective: *The study aims to assess whether a single face-to-face counseling intervention can significantly improve self-efficacy among teachers.*

Methods: *This experimental study employed a pre-and-post-test design involving 23 high-school vocational teachers (14 females and 9 males) who participated in a one-day, three-hour counseling session by trained nutritionists. Participants underwent anthropometric measurements and MetS risk screening before the intervention. Self-efficacy was assessed using a validated questionnaire before and after counseling. Statistical analyses were conducted using paired t-tests and chi-square or Fisher's Exact tests.*

Results: *The findings indicated a significant increase in self-efficacy scores from a baseline mean of 26±2 to 28±2 after the intervention ($p<0.001$). Notably, the proportion of teachers who reported confidence in selecting appropriate foods significantly improved ($p=0.02$). The prevalence of obesity among participants was high, with 57% categorized as obese based on BMI.*

Conclusion: *Targeted nutrition counseling can effectively enhance self-efficacy among teachers, potentially leading to healthier lifestyle confidence and reduced MetS risk. This study underscores the importance of incorporating nutritionist-led interventions in educational settings to promote health among teachers, who serve as role models for students.*

KEYWORDS: *Nutrition counseling; self-efficacy; metabolic syndrome (MetS); obesity; health promotion; teachers.*

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INTRODUCTION

Metabolic syndrome (MetS) is a condition of metabolic abnormalities that significantly increase the risk of developing cardiovascular diseases, type 2 diabetes mellitus, and other chronic diseases. It has emerged as a critical public health concern due to its association with substantial morbidity and mortality (1). It was estimated that MetS prevalence in Indonesia was approximately 21.66%, which was significantly higher than other Southeast Asian countries such as the Philippines (11.9%).(2)

Limited study in Indonesia focusing on the prevalence of MetS among teachers. Two studies indicated that the prevalence of MetS among teachers in Jakarta was 24.6% while in Sulawesi was 39.5%(3,4). Several determinant factors have been known to increase the MetS among teachers, such as having a BMI>25 kg/m^2, being less active, central obesity, sitting more than 4 hours/day, age, and dietary pattern (3–5).

Nutrition plays a significant role in managing and preventing MetS. Effective dietary interventions can significantly improve health outcomes by targeting the underlying metabolic

disturbances(6). Nutritionist-led counseling programs have shown promise in various settings by providing personalized dietary guidance and support, which can enhance individuals' self-efficacy.(7) Self-efficacy —the belief in one's ability to execute behaviors necessary to manage their health.

Self-efficacy is a key determinant of health behavior change. Individuals with high self-efficacy are more likely to engage in health-promoting behaviors, adhere to dietary recommendations, and ultimately manage their metabolic risk factors more effectively(8). In educational settings, where stress and sedentary behavior are prevalent, enhancing self-efficacy through tailored nutritional counseling could be particularly beneficial.

This study aims to evaluate the impact of a nutritionist-led counseling program on self-efficacy among teachers at SMK Roudlotun Nasyiin in Mojokerto. By focusing on this specific population and intervention, the research seeks to contribute to the understanding of how targeted nutritional support can influence self-efficacy and, consequently, metabolic syndrome risk. The findings may provide valuable insights for developing more effective health promotion strategies within educational institutions and beyond.

METHOD

This is an experiment research (with pre and post test) examining the effect of nutritional counseling on self-efficacy towards health among high school vocational teachers in SMK Roudlotun Nasyiin. This vocational school is located in Mojokerto, East Java Province, Indonesia. Of 35 total teachers, twenty-three volunteered to participate in one day of counseling (3 hours duration), given by trained nutritionists after receiving an assessment including anthropometric measurement and MetS screening risk. The number of participants was regarded as sufficient to achieve significance with $\alpha=0.05$ and a side effect of 3.27 according to a prior study (9).

The anthropometry measurements included Body Mass Index (BMI) and visceral and total body fat percentage using Microtoice and Bioelectrical Impedance Analysis (BIA) portable scale version HBF-375 (Omron Dalian Co., Ltd, Kyoto, Japan). Total body fat of more than 25% in males is considered obese while for females is more than 32% (10). The MetS risk data was collected from an interview conducted by a trained nutritionist using a questionnaire (11). The questionnaire consists of eight questions with each question scores ranging from either 0-3, 0-4, or 0-1 (depending on the option of the question), contributing to a maximum total score of 13 points. If the respondent has scored≥7 points, then they are categorized as a person with a high risk of MetS.

The anthropometry and MetS risk screening were used as data to conduct a counseling session. The session of counseling lasts for 1-2 hours and aims to improve the self-efficacy of the client to set a healthier lifestyle and dietary patterns. A pocketbook related to MetS prevention and management was developed by the research team and used as media to help clients understand the counseling topic (figure 1). Clients were requested to self-administer a Hypertension self-efficacy questionnaire (12) before and after counseling. The questionnaire consists of ten questions with

three scale options, *incapable* (scored 1), *limited capability* (scored 2), and *capable* (scored 3). Thus, in total the questionnaire scores 10-30 points.

Figure 1. The pocketbook is used as the media for counseling in this present study. This book consists of several chapters, namely 1) what is metabolic syndrome; 2) what are the signs and symptoms of metabolic syndrome; 3) metabolic syndrome evidence in Indonesia; and 4) how diet can prevent and manage metabolic syndrome.

Anthropometry and MetS data were presented descriptively as Mean±SD. The proportion of respondents (incapable and limited capability vs. capable) in each statement item from the GSES questionnaire was compared before and after the intervention by using either chi-square or Fischer Exact test. The self-efficacy data were compared before vs. after counseling using student paired *t*-test to see the effect of counseling on clients' self-efficacy. A p-value of less than 0.05 was considered as significant. Statistical analysis was conducted using IBM SPSS software. This study obtained ethical approval from the Poltekkes Kemenkes Surabaya ethical committee with protocol number No.EA/2980/KEPK-Poltekkes_Sby/V/2024.

RESULTS

A total of 23 volunteers, consisting of 14 females and 9 males participated in this present study. The mean age of participants was 37±13 years old. Respondents' characteristics can be seen in Table 1 below. Of 23 respondents, only 10 people had a BMI less than 25 kg/m^2 and thus this subsample of teachers was eligible for MetS risk screening using a questionnaire developed previously by Je, et al. (2017) aimed at non-obese adults (11). Our result showed that among those 10 eligible participants, the score of MetS was 4.73 on average. Two participants were regarded with high risk for developing MetS.

According to BMI for the Asia-Pacific population, 57% of our respondents were categorized as obese while the rest of 39% was non-obese. When the obesity category was defined using the percentage of total body fat, the prevalence of obese respondents was 61% whereas non-obese respondents were 39%.

Table 1. The Characteristics of Participants in This Study

Characteristics	n (%)
Gender	
Male	9 (39%)
Female	14 (61%)
BMI category	
Obese (BMI≥25 kg/m^2)	13 (57%)
Non-obese (BMI<25 kg/m^2)	10 (43%)
Total Body Fat	
Obese	14 (61%)
Non-Obese	9 (39%)
Metabolic Syndrome Risk[1]	
At risk	8 (80%)
Lower Risk	2 (20%)

The respondents that were eligible for MetS risk screening were only 10 out of 23 according to Je et al (2017) questionnaire

We analyzed respondents' self-efficacy statements for each questionnaire item. Generally, in baseline state, most of the teachers stated that they were capable to maintain blood pressure, weight, stress, caffeine intake, refraining from smoking, and medication prescribed by their doctor (as depicted in Table 2). Notably, all respondents reported that they were able to avoid consuming alcohol. Conversely, the items that garnered the most responses indicating limited capability or inability to perform were selecting appropriate foods, engaging in physical activity, and avoiding exposure to secondhand smoke. A significant difference was observed in one item, specifically statement number 3, between the pre-and post-counseling intervention periods (X^2 = 5.8, p-value < 0.05). Notably, there was no change in the proportion of teachers reporting the capability to avoid consuming alcohol or refrain from smoking between the pre-and post-intervention periods. There was a similar proportion of teachers reporting capable of avoiding alcoholic drinks and refraining from smoking before vs. after counseling.

Table 2. Respondent Percentage Answering the Self-Efficacy Statement into three Levels Before and After Counselling Session

No	Statement Items	Baseline			After Receiving a counselling			X^2	P-value
		I	L	C	I	L	C		
1	I am able to visit a health officer to monitor my blood pressure	5%	18%	77%	5%	5%	91%	0.7	0.4
2	I am capable of maintaining my body weight to avoid becoming overweight.	0%	50%	50%	0%	32%	68%	0.8	0.4
3	**I am capable of selecting appropriate foods for hypertension patients, such as low-sodium, low-fat foods, fruits, and vegetables.**	**9%**	**55%**	**36%**	**5%**	**23%**	**73%**	**5.8**	**0.02**

4	I am able to engage in physical exercise for at least 30 minutes each day or as recommended by a healthcare professional.	18%	50%	32%	5%	45%	50%	0.8	0.4
5	I am capable of avoiding the consumption of alcoholic beverages.	0%	0%	100%	0%	0%	100%	0.09	0.4
6	I am able to reduce my caffeine intake, such as from coffee.	5%	23%	73%	0%	9%	91%	1.7	0.2
7	I am capable of managing stress when facing challenges.	0%	32%	68%	0%	14%	86%	1.2	0.3
8	I am able to refrain from smoking.	5%	14%	82%	5%	14%	82%	0.0	1.0
9	I am capable of avoiding exposure to others who are smoking.	9%	45%	45%	0%	36%	64%	1.3	0.2
10	I am capable of using medication according to the instructions when prescribed by a healthcare professional	0%	14%	86%	0%	18%	82%	0.0	1.0

I = incapable, L = limited capability, and C=capable

Furthermore, we analyzed the overall self-efficacy scores, which were calculated from the aggregate of 10 statements. At the outset, the baseline mean score was 26±2 points. Following the counseling session, the mean score exhibited a statistically significant increase of 2 points, resulting in a post-counseling score of 28±2 points (as depicted in Figure 2). A paired t-test revealed a p-value of <0.001, indicating a significant difference between the self-efficacy scores obtained before and after the counseling intervention. This finding suggests that the counseling event had a notable impact on participants' self-efficacy.

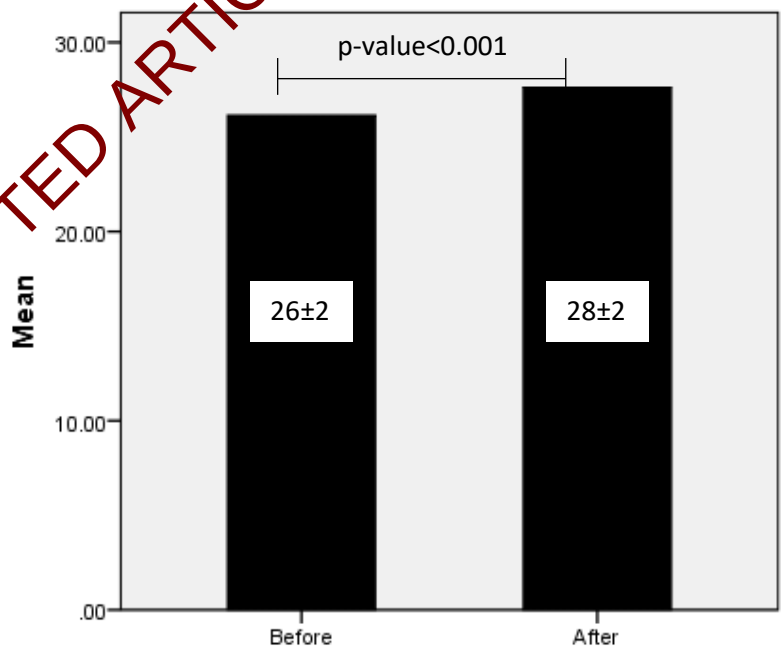

Figure 2. Self-Efficacy Mean Score After (Right Bar) vs. Before (Left Bar) Given a One-Day Counselling Intervention. The mean score of the self-efficacy after and before intervention was 28±2 and 26±2 (p<0.05 based on an independent t-test).

DISCUSSION

Mostly, our respondents were categorized as obese, both when assessed using BMI for the Asia-Pacific population (13) and total body fat percentage cut-offs. The prevalence of obesity among the teachers in this population was considered as high. Our finding is in accordance with a study conducted among a sample of teachers in Jakarta indicating that the prevalence of obesity was about 64.5%.(4) Another study which was also carried out in Jakarta, suggested a similar result, suggesting a prevalence of 63.1% concerning obese teachers (14). In other countries such as India, it has been suggested that the obesity prevalence among teachers, especially among female teachers, was 70.2% (5).

Obesity, especially abdominal obesity is strongly linked with MetS (3). In our study, the MetS risk was assessed using a questionnaire screening aimed for non-obese adults. This method is in contrast with the characteristics of our respondents which more than half (57%) teachers were categorized as obese. Other criteria for MetS using International Diabetes Federation (IDF) or WHO, which require additional diagnostic assessments such as prediabetes or diabetes, elevated non-HDL cholesterol, and blood pressure (1) might be burdensome for some of the respondents and demand higher compliance.

As the MetS prevalence is increasing in the global world, including in Indonesia, there is a need to prevent and manage this condition (2). In this study, we involved teachers as the targeted population. School teachers can be considered as the best role models, especially for healthy behavior among their students (15). For instance, a study conducted in preschoolers demonstrated that students were more active if taught by teachers whose higher physical activity (16).

This present study examines the importance of a client-centered counseling intervention on general health self-efficacy. Self-efficacy is defined as how confident an individual is to be able to perform a particular behavior (17). Previously, many trials have suggested that counseling intervention significantly improves self-efficacy in various objectives, including breastfeeding continuation among lactating women (9), self-management among tuberculosis outpatients (18), and decreasing cardiovascular risk among the elderly (19).

The significant contribution of our study is that we demonstrated a face-to-face counseling even when conducted in a single session, could enhance teachers' self-efficacy. In this study, the counselors consisted of experienced nutritionists and a dietitian. It is known that a counselor's performance is an important factor that can increase self-efficacy in counseling (20). This finding might suggest that counseling if performed by experienced counsellors could bring beneficial impact to improve self-efficacy among targeted people who are busier and have a limited availability to conduct an extensive intervention health program.

Our finding shows that there was a moderate enhancement in teachers' self-efficacy after giving a single face-to-face counseling. However, the effect size was considered significant. Another important result was derived from the self-efficacy items analyses. It is also clearly seen that the

intervention increased the proportion of teachers who were confident about eating a nutritious diet, hence those who reported a higher self-efficacy score.

It has been reported that nutrition intervention conducted in workplace sites was more favorable among overweight and obese people, especially among the male population. A systematic review indicates that the overweight and obese men population is difficult to recruit in the healthcare setting. Therefore, place setting consideration is very important for health promotion, especially among the male population (21). In this present study, men and female teachers with obese and non-obese profiles were included. Unfortunately, the small sample size did not allow us to further analyze whether the counseling intervention has a different effect with regard to gender and BMI categories. Since this aspect is very interesting to explore, a trial including a large sample is warranted to investigate whether gender and BMI have any effects on counseling effectiveness.

It was notable that face-to-face counseling became the most common delivery method in nutrition intervention rather than indirect methods. Other delivery methods including telephone follow-up and home visits accompanying face-to-face intervention could enhance the effectiveness of the intervention (21). In addition, we also used a pocketbook as the media in the counseling process. This pocketbook was developed by the researcher team and it provides information about several aspects including MetS introduction, MetS condition in Indonesia, and how diet and lifestyle can be implemented to prevent and manage the condition of MetS. These materials are very important as the information to increase the self-efficacy of our respondents.

In this study, we used the hypertension self-efficacy questionnaire to assess the effect of the counseling because currently, the questionnaire directed for MetS is not available yet in the literature. The questionnaire to measure self-efficacy among people with hypertension however is relevant to the content of our counseling themes. Nevertheless, it has been known that hypertension is the part or element of MetS and both these conditions are strongly connected. Dietary Approaches to Stop Hypertension (DASH) diet that is originally designated to control and prevent hypertension also has a positive benefit for people with MetS (22,23).

The disadvantage of this present research is due to the absence of a control group to compare the outcomes. Therefore, future research is warranted to conduct a quasi-experimental design, incorporating two arms (control vs. intervention groups) to better study the effect of counseling on client's self-efficacy. Additionally, this research only focuses on self-efficacy improvement that was self-reported by the targeted population rather than observed behaviors. Although a study indicated that multiple nutrition counseling given in a week could improve diet among people with T2DM (24), the greatest effect of dietary behavior change could be observed 6 to 12 months after the intervention (21). Thus, a long-term and intensive health promotion program in the future might be employed when addressing behavioral change.

CONCLUSIONS AND RECOMMENDATION

Our finding suggests that a single face-to-face counseling intervention has a significant beneficial effect on self-efficacy toward health among a group of teachers. As the obesity prevalence is high among the teacher population and at the same time the metabolic syndrome is increasing as well, a nutritionist-led counseling program might be implemented targeting the teacher population. Based on our discussion, future trials including a large sample size are warranted to study whether nutrition counseling has a different effect on health self-efficacy across different gender or BMI conditions. In addition, a long-term effect such as observed behavior is warranted to be incorporated in future studies.

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