

Review

Do Indonesians follow its Dietary Guidelines? - evidence related to food consumption, healthy lifestyle, and nutritional status within the period 2000-2010

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Dietary Guidelines are sets of advisory statements that give dietary advice for population to promote nutritional well-being. They contain information on foods or behaviors that are encouraged and cautionary messages derived from scientific evidence-based reviews and specific local conditions. The Indonesian Dietary Guidelines consisting of 13 messages that were publicized by the Ministry of Health in 1995 and have not been reviewed afterward in relation to nutritional status and health outcome of the population. By reviewing studies on different age groups in the past 10 years and comparing the results with the recommended guidelines, this paper aims to identify if messages have been successfully applied and if there are relevant issues not yet covered in the guidelines. The reviews covered 29 out of 33 provinces, representing studies from sub-district or higher levels (district, provincial, national). Results showed that some messages have been better implemented than others; also that information for some messages was not available for which to conclude of its implementation. In addition, some practices were identified which are prevalent in several age groups and have important public health consequence, but not yet included in the 13-guidelines. These include: smoking, increased intakes of fruit and vegetables, limited intakes of salt and sugar, increased intakes of foods rich in zinc and calcium (besides iron), hand-washing before food preparation and eating, and weight-monitoring. For infants and young children, nutrient density, feeding responsiveness and stimulation should be specifically highlighted. Based on the results, several recommendations in revising the guidelines were given.

Key Words: Dietary Guidelines, Indonesia, food consumption, healthy lifestyle, nutritional status

INTRODUCTION

International call for the development of a food based dietary guidelines (FBDGs) to promote appropriate diets and healthy lifestyle started in the 1992 International Conference on Nutrition when 159 Head of states committed to a plan of action on nutrition. Dietary guidelines, which is defined as sets of advisory statements that give dietary advice for population to promote overall nutritional well-being and relate to all diet-related conditions, was firstly discussed on a joint Food and Agriculture Organization (FAO)/World Health Organization (WHO) expert consultation in 1995.¹ The guidelines shall provide advice in qualitative and quantitative information for different age groups and lifestyles appropriate for individual countries. They commonly contain information on foods or behaviors that are encouraged and cautionary messages derived from thorough process of scientific evidence based reviews of demographic, epidemiological, nutritional and social transitions,²⁻⁴ as well as specific health, behavior, culture and economic conditions within a country.⁵⁻⁷ In the years afterward, the need to develop or improve the guidelines has been continuously reiterated globally and regionally.⁷⁻¹² The end goal of adherence to FBDG is a good quality of life for the whole life cycle.

The Indonesian Dietary Guidelines for the general population were publicized by the Ministry of Health (MoH) in 1995, and consisted of the following messages:¹³

- Eat a wide variety of foods
- Consume foods to provide sufficient energy
- Obtain about half of total energy from complex carbohydrate-rich food
- Obtain not more than a quarter of energy from fats or oils
- Use only iodized salt
- Consume iron-rich food
- Breastfeed your baby exclusively for 4 months
- Eat breakfast
- Drink adequate quantities of fluid that are free from contaminants
- Do physical activity regularly

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- Avoid drinking alcoholic beverages
- Consume food which is prepared hygienically
- Read the labels of packaged foods

The 13 Basic Messages to Balance Diet (locally known as *13 Pesan Dasar Gizi Seimbang* or *Pedoman Umum Gizi Seimbang*, abbreviated as PUGS), were tested in 14 provinces and is supplemented with an explanation booklet presented in lay language with color sketches. A more detail guide was also produced, as well as a pictorial illustration of the guideline, represented by a three-layer traditional arrangement of foodstuffs served in a rice cone form, locally known as *Tumpeng*. The booklet provided the following additional information: (1) description and type of: carbohydrates, safe food, and information that should be written on labels; (2) food sources for: energy, protein, vitamin and mineral, carbohydrate, iron-rich food and examples of breakfast; (3) portion size for: daily carbohydrate, daily salt consumption, and minimal consumption of fluid per day; (4) measurement tool: Body Mass Index as a tool to monitor body weight; (5) Benefits or the importance of: breast milk, supplementary food, eating breakfast, water consumption, and physical activity and sport; (6) health consequences of excess fat and salt intakes, inadequate iron intake, imbalance between energy intake and expenditure, unsafe food, and alcohol consumption (7) suggestions or recommendations to: use vegetable oil, including minimum and maximum consumption of fat or oil in terms of total energy, consume fish, take iron-tablet for pregnant women, give colostrums, continue breastfeeding until 24 months, pay attention to mother's intake during pregnancy & lactation, boil water, and pay attention to safe water.¹⁴ The three-layer rice cone was revised in 2002, with the following modifications: (1) it now contains 4 layers: energy source foods at the bottom layer, vegetables and fruit at the second layer, animal and plant protein at the third layer, and sugar and salt at the top layer; (2) the separation between animal and plant proteins (milk is included in the animal protein), addition of sugar and salt at the top layer; (3) inclusion of suggested serving; (4) deletion of fats and oils; (5) revision of breastfeeding message to "Provide only breast milk for baby until four months old, after which breast milk should be supplemented with complementary foods".

The guidelines covered a wide range of issues relevant for the Indonesian context, from the point of view of educational, nutrition and health aspects. It provides information on quantity and quality of food including water, basic information on description, sources and portion, the benefits and health consequences of unsafe food, inadequate and excess intake, as well as recommendations to follow. The basic information would be very helpful in educating most Indonesians because about 40% of the population has only primary education.¹⁵ The expected increase of the double-burden of nutrition problem and its health consequences was already anticipated in the guidelines, as well as information on improving quality of life and healthy lifestyle. In 1996/1997, 15% of males and 24% of females 18 years and older were overweight and obese (defined by BMI >25 and >27, respectively).¹⁶ In 2010, the obesity prevalence remained high in adults and was present in children under the age of five (16% in males

and 27% in females adults using the same BMI cut-off points and 14% in children).¹⁷

Because dietary guidelines are developed to promote health and the prevention of disease, it is relevant to explore the application of these guidelines in terms of food consumption, physical activity, healthy lifestyle practices, nutritional status and health outcomes of the population. By reviewing studies of different age groups in the past 10 years and comparing the results with the recommended guidelines, the authors try to identify if messages have been successfully applied and whether there are issues not yet covered in the guidelines. The discussions brought up by this paper can serve as recommendations in revising the guidelines.

CHARACTERISTICS OF THE STUDIES

Systematic reviews of published and unpublished studies or reports searched in the libraries and relevant institutions in Java and Bali in the last 10 years (Jan 2000 - April 2010) were conducted for several age groups: children under the age of five, school-age children (6-12 year), adolescent (13- <18 year), pregnant and lactating women, adults (18- <55 year) and elderly (≥ 55 years).¹⁸⁻²³ In total, 923 studies were included in those reviews, covering information from national, provincial, district, sub-district and lower levels. In this paper, studies reporting information lower than sub-district levels were not included to maintain sufficient representation of the population's rather than specific cluster's information. The majority of the studies represent information that was representative at the district levels (45-66%). Although our data may not cover literatures present in libraries outside Java and Bali, published papers in national and international journals were fully accessed through online search and visit to the central library under MoH Indonesia and made up 40% of the total papers reviewed. By including cross-sectional, cohort or baseline intervention studies with samples numbers above 80, information from 29 out of 33 provinces in Indonesia were represented.

We divide the results and discussions into the following sections: adherence to the existing guidelines, issues not yet covered in the guidelines, and socialization of the messages. Food and non-food related issues would be elaborated.

ADHERENCE TO THE 13 DIETARY GUIDELINES MESSAGES

Information obtained from the systematic reviews was tabulated for each of the 13 messages and age groups (Table 1). Data was obtained from 1-13 studies. For data that were unavailable, 'no data' label was shown in the respective cells.

Food related messages

Dietary diversity was characterized by medium to low diversity in under fives, while in adults it varied widely. Food choices related to belief and taboo was reported especially amongst pregnant women, infants and the elderly. While energy intake was still inadequate in 41% of the population, obesity was found in all age groups, with an increase trend between 2007 and 2010.^{17,24} Fats and

Table 1. Adherence to the 13 dietary guideline messages in different age groups as available in the systematic reviews on studies conducted in the last 10 years (2000-2010)

Guidelines	Children under the age of five	School children	Adolescent	Pregnant/lactating women	Adult	Elderly	National basic health research
1. Eat a variety of food	High diversity (≥ 5 food groups)=61% (n=3) †	No data	No data	No data	High diversity (≥ 5 food groups): 10-94% (n=3) †	No data	No data
2. Consume foods to provide sufficient energy	No data	Energy $\geq 80\%$ AKG: 4-81% (n=7) ‡	Mean energy intake: 1,607-2,248 kcal/d or 82-107% AKG (n=10) ‡	Mean energy intake: 1,575-2,239 kcal/d or 75-107% AKG (n=4) ‡	No data	Adequate (incl. excessive) energy intake: 15-85% (n=4)	59% consumed $\geq 70\%$ AKG for energy (2010) ‡
3. Obtain about half of total energy from complex carbohydrate-rich food	No data	No data	No data	No data	No data	Total carbohydrate intake: 156-235 g/d (n=4)	National=61%, Urban=59%, Rural=64% (2010)
4. Obtain not more than a quarter of energy from fats/oils	No data	No data	No data	No data	No data	Mean daily fat intake: 37-41 g/d (n=4)	National=26%, Urban=28%, Rural=23% (2010)
5. Use only iodized salts	19-84% (n=2)	No data	0-34% (n=3)	24-100% (n=7)	No data	No data	62% (2007)
6. Consume iron-rich foods	No data	No data	No data	No data	Meat & meat product intake = 34 g/d; Animal protein $>5x/wk$ = 6-58% (n=11)	Meat, fish, poultry intake $<20\%$ (n=4)	No data
7. Breastfeed your baby exclusively for 4 months	Urban: 15-59% (n=3); Rural: 16-85% (n=3)	Not relevant	Not relevant	Not relevant	Not relevant	Not relevant	Exclusively breastfed at age 5 mo=15%; early initiation of breastfeeding =29%; prelacteal=44%; colostrums =75% (2010)
8. Eat breakfast	No data	81-100% (n=8)	23-94% (n=8)	No data	No data	No data	No data
9. Drink adequate quantities of fluid that are free from contaminants	Boiled water: 25-41% (n=2)	Clean water utilization: 13-99% (n=2)	No data	No data	No data	No data	No data on consumption; boiled water 78% (2010)
10. Do physical activity regularly	No data	Adequate: 26-92% (n=3) §	Adequate: 16-52% (n=4) §	Adequate: 19-89% (n=13) §	Adequate: 19-88% (n=10) §	No data	Adequate age >10 yr 52% (2007) §
11. Avoid drinking alcoholic beverages	No data	No data	Alcohol drinker: 23-66% (n=3)	No data	No data	Alcohol drinker: 0-9% (n=3)	3% age >10 yr (2007)
12. Consume food which is prepared hygienically	handwashing before cooking = 40-60% (n=2); before feeding = 3-66% (n=7)	No data	No data	No data	No data	No data	Correct handwashing 23% (2007) ¶
13. Read the labels of packaged foods	Read expiry date in label: 59% (n=1)	No data	No data	Read expiry date in label: 4-36% (n=3)	No data	No data	No data

n = number of studies from which the data was obtained. Data was extracted from reports of different age group: under five (Fahmida and Rospita, 2010); school-age children (Sulistiyowati and Purwaningtyas, 2010); adolescent (Wahyuni and Krisnamurni, 2010); pregnant and lactating women (Hartriyanti et al, 2010); adults (Susiloretmi and Sunarto, 2010); the elderly (Prihatin and Noormintarsih, 2010). † based on FANTA dietary diversity score (Swindale and Bilinsky, 2006): low (<2 food groups), medium (3-4 food groups) and high (≥ 5 food groups). ‡ AKG = Angka Kecukupan Gizi (Indonesian RDA). § adequate was defined as 5 times or more per week of 30 minutes or more each. ¶ washing hands with soap before eating, before preparing food, after defecating, after cleaning child's feces, and after touching poultry/animals

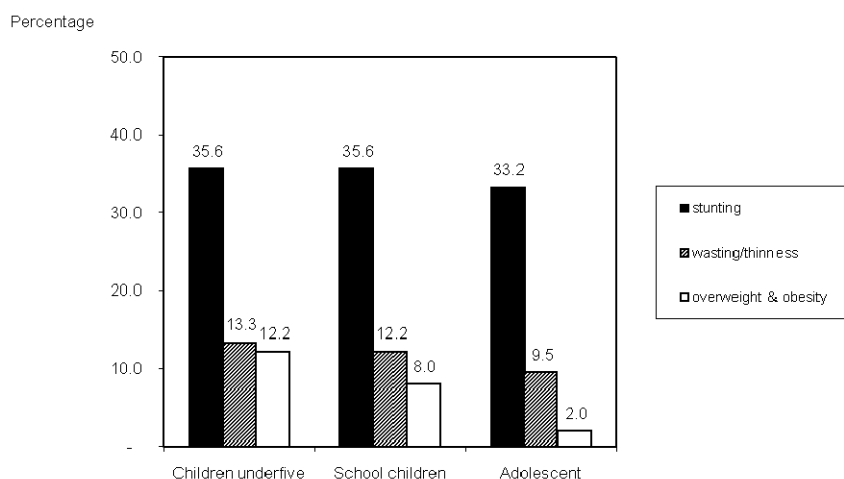


Figure 1. The undernutrition and overnutrition situation in Indonesia 2010

oils contributed to more than a quarter of total energy intake in urban areas (28%), with the highest in Jakarta, capital of the country (30%). Because problems of both macro-and-micronutrient deficiencies are still present in Indonesia (Figure 1), messages related to dietary diversity should be maintained. Varieties of food suggested should not only be from energy sources, but also from protein, vegetables, and fruit sources. The suggestion of consuming a variety of foods including the emphasis on consuming plenty of vegetables and fruits is found in most FBDGs.²⁵⁻²⁹ However, messages addressing the overnutrition phenomena should also be formulated to prevent future degenerative diseases, such as obesity, cardiovascular diseases, and diabetes.

The ranges of population nutrient intake goals, i.e. population average intake that is judged to be consistent with maintenance of health in a population, from percentage of daily total energy intake based on joint WHO/FAO expert consultation on diet, nutrition, and the prevention of chronic diseases, are as follows: total fat 15-30%, total carbohydrate 55-75%, protein 10-15%, cholesterol <300 mg, and free sugar <10%.³⁰ To promote cardiovascular health, diets should provide <10% saturated fatty acids (SFAs), 6-10% polyunsaturated fatty acids (PUFAs), <1% *trans* fatty acids. High intake of free sugars only supplies large amount of energy without providing other nutrients and the restriction of it will reduce the risk of unhealthy weight gain.

The promotion of re-popularizing traditional tubers, such as cassava, sweet potato, *talas*, *ganyong*, and *uwai*, as alternate energy source food other than rice, should be continued. In its program called "I eat variety, nutritious, balance, and safe food" (*Panganku Beragam Bergizi Seimbang dan Aman*, abbreviated as B2SA), the Ministry of Agriculture, through their Food Security Agency, has revitalized this campaign.³¹ The suggestion to increase consumption of tubers, in addition to cereals, is mentioned in the "Malaysian & Chinese guidelines".^{27,29} In addition, the recommendation to eat whole grain and complex carbohydrate should be considered. Unfortunately, the current compilation data cannot present consumption of complex carbohydrate-rich food.

Intakes of micronutrients from the diet suggested that for some to most parts of the population, intakes were not adequate. Iodized salt is still not consumed by 38% of the

population.²⁴ In the current guidelines, the focus is still on eliminating Iodine Deficiency Disorder (IDD). However, with the increase trend of hypertension, high blood pressure, and other degenerative diseases, recommendation to limit salt intake in the future should be considered. The words used to represent food in limitation may be: "avoid", "reduce", "consume less", "in moderation", "low level", and "without added". The recommendation of daily sodium chloride or sodium intake is <5 g or <2 g respectively.³⁰ Intake of no more than 1.7 g of sodium daily is beneficial in reducing blood pressure. Thus, recommendations on salt intake for Indonesia needs to take into account both IDD and hypertension prevention.

The following WHO recommendation summarizes important FBDG messages: (1) achieve an energy balance and a healthy weight; (2) limit energy intake from total fats and shift fat consumption away from saturated fats to unsaturated fats and towards the elimination of trans-fatty acids; (3) increase consumption of fruits and vegetables, legumes, whole grains and nuts; (4) limit the intake of simple sugar; and (5) limit salt / sodium consumption from all sources and ensure that salt is iodized.³² Another WHO publication pointed out "Five Keys to a Healthy Diet": (1) give baby only breast milk for the first 6 months of life; (2) eat a variety of foods, i.e. combination of staple foods, legumes, vegetables, fruits and foods from animals; (3) eat plenty of vegetables and fruits; (4) eat moderate amounts of fats and oils; (5) eat less salt and sugars.³³

While not many studies reported intakes of iron-rich foods, it can be referred from the prevalence of anemia from the last 10-year studies that this message was not yet implemented by the majority. The approach used in analyzing iron-rich food is by evaluating the consumption of protein source food. The message to consume iron-rich food is intentionally to improve health condition of pregnant and lactating mothers. This message should be kept, because it is still a problem for female adolescents, pregnant- and lactating women.

The practice of exclusive breastfeeding is low, especially in urban areas. Giving babies breast milk exclusively for the first 6 months should be the new recommendation as it is the worldwide recommendation by the WHO. Knowledge on the importance of exclusive breastfeeding can be promoted via radio or television to achieve

high number of listeners. The messages should be regularly repeated and addressed to all age groups. The promotion should be supported by easy access to nursery room, milk storage, and daycare service at work and public places, as well as a firm government regulation of a 6-month maternal leave. The essentials of family and community supports should also be communicated.

Some studies reported that habit of eating breakfast was not practiced by more than half of the adolescents. Its practice was better in school children. Breakfast as an important meal of the day should be reinforced; in school children breakfast improves concentration and school performance.³⁴ The Korean's guideline reiterated "not to skip breakfast".²⁶ Amongst adolescent, alcoholic drink consumption was reported. The recommendation of drinking alcohol varied from none to moderate intake. It is highly recommended to keep the present message of avoiding alcoholic beverages for Indonesia.

Studies on fluid intake were rarely conducted. The practice of drinking unsafe water is still found. An individual's daily aqueous fluid ingestion requirement is approximately to cover obligatory water and perspiration losses due to increased physical exertion and climate. Daily water intake of 2 liters for adults is commonly used by the WHO in drinking water guidelines. Daily water requirement for hydration on average are: 2.2 liters for adult females, 2.9 liters for adult males, 1 liter for children, 4.8 liters for pregnant women, and 3.3 liters for lactating women.³⁵ For manual labor in high temperature, the requirement can be up to 4.5 liters. Humans ingest water as plain drinking water, beverages, water in food, and water from metabolism of food. About one-third of the daily average fluid intake is derived from food, thus the remaining water requirement must be met from consuming fluids. Examples of guidelines on water are: drink water instead of sugary drinks (US), and drink plenty of water (Malaysia). Recommendation to consume milk or milk products daily is present in several guidelines.^{25, 27, 29}

Non-food related messages

The lowest physical activity was reported amongst adolescent and adults. The WHO "Five Key to appropriate physical activity" are: start regular physical activity and reduce sedentary activities, be physically active every day in as many ways as you can, do at least 30 minutes of moderate-intensity physical activity on 5 or more days each week; enjoy some regular vigorous-intensity physical activity for extra health and fitness benefits (e.g. football, badminton, basketball, aerobics, running, swimming); and school-aged young people should engage in at least 60 minutes of moderate – to vigorous intensity physical activity each day.³³ With about half of the people aged 10 years or older not exercising enough, i.e. less than 10 min per activity and less than 150 min for 5 days within a week, serious call to physical activity has to be made countrywide. Examples of conducive environments are: making safe bicycle and pedestrian lanes, improving public transportation to discourage the use of cars, and encouraging people to walk to public transport stops. At workplaces, staff should be provided with facilities and encouraged to be physically active, e.g. using the stairs, doing aerobic dance or doing sports. No data is specifi-

cally found on hygienic food preparation. Reading food labels was not common practice. When practiced, consumers mainly referred to brand, expiry date, and "halal" sign and less to the nutrient facts in the label.

Nutritional outcomes

Data from the latest 2010 national basic health research showed that about half (51%) of children under the age of five were either stunted and/or wasted.¹⁷ There was a linear trend showing that subjects who were normal both in weight-for-height and height-for-age Z-scores were higher in the highest quintiles of the household expenditure (proportion of subjects with no stunting nor wasting were 42%, 46%, 51%, 54% and 60% in lowest to highest quintiles, respectively). The same pattern was observed with regard to education level of household heads, where the proportion of normal subjects was lowest amongst illiterate (43%) and highest amongst those with university background (58%). On the other hand, overweight and obesity emerged in children under the age of five and in school-age children (12% and 8% respectively).²⁴ Reported prevalence of overweight was highest amongst adults, especially female adults, where central obesity were 8% in males and 29% in females.

Results of these nutritional outcomes supported data on borderline-high fat and low fiber (as fruit and vegetable) intakes which was accompanied by low physical activity. Amongst adults, prevalence of degenerative diseases was reported as follows: hypertension 32%, stroke 6%, heart 7%, diabetes mellitus 6% and glucose intolerance 10%. This data suggested that limiting intakes of fat, salt, and sugar should also be addressed in FBDG messages.

ISSUES NOT YET COVERED IN THE GUIDELINES

Data from studies conducted in the last 10 years and the "national basic health research 2007" showed that several practices were problematic in the population, but were not addressed in the 13 Dietary Guidelines messages. These include inadequate intakes of fruit and vegetable (fiber intakes), smoking and hand-washing (with soap) before food preparation and feeding or eating (Table 2). These issues were identified in 3-4 age groups and were supported by the latest available national figures.

Food-related issues

With 94% of the people above the age of 10 years eating vegetable and/or fruit less than the minimum 5 portion per day in a 7-day period, effort to increase the consumption of vegetables and fruits are necessary. This recommendation is generic globally. The words "consume plenty or increase intake" are commonly used to relay the message. The ranges of population nutrient intake goals from percentage of daily total energy intake for fruits and vegetables are ≥ 400 g/day.³⁰ The practice of "raw vegetable or fruit snacking" may replace the habit of consuming sweet and salty foods daily, which was practiced by 65% and 25% of the population, respectively.

For fiber, the words used can be "eat more fiber, choose food that provides higher fiber" as in Taiwan and the US's FBDGs.^{28,36} However, there is no population goal for total dietary fiber or non-starch polysaccha-

Table 2. Other data available in the systematic reviews of studies conducted in the last 10 years (2000-2010)

Type of data	Under five	School children	Adolescent	Pregnant/lactating women	Adult	Elderly	National basic health research
Smoking	<i>Not relevant</i>	<i>Not relevant</i>	1-66% (n=23)	<i>No data</i>	7-70% (n=17)	10-28% (n=4)	daily=28%, sometimes=7% (2010)
Fruit and vegetable consumption	Average servings per week: fruit=2, vegetable=5 (n=1)	<i>No data</i>	Consumed fruit: rural=61%, urban=45%. Consumed vegetable: rural=80%, urban=60% (n=5)	<i>No data</i>	Consumed fruit & vegetable $\geq 5x/wk$: 16% in 2004, 6% in 2007 (n=2)	Consumed fruit = 10-70%; vegetable = 30-85% (n=5). Rural lower than urban: fruit 16 vs 66 g/d; vegetable 40 vs 69 g/d (n=4)	Consumed fruit and vegetable $\geq 5x/week$ = 6% (2007)
Hand-washing with soap before food preparation, before eating and after defecation	Before food preparation = 40-59% (n=2); Before feeding = 3-66% , with soap=25% (n=8)	26-62% (n=6)	<i>No data</i>	<i>No data</i>	38-73% (n=3)	<i>No data</i>	National=23%; Males=19%; Females=28% (2007)
Other age-specific issues	Low nutrient density due to inadequate intakes of nutrient-dense foods or fortified foods rich in iron, zinc and calcium (n=3)	Street food (mainly junk food and/or with unsafe food additives e.g. colorings, sweeteners: 48-68% (n=2)	<i>No data</i>	Food avoidance due to taboo	<i>No data</i>	<i>No data</i>	<i>No data</i>
	Responsive feeding i.e. persuade child to eat: 28-70% (n=5).	<i>Not relevant</i>	<i>Not relevant</i>	<i>Not relevant</i>	<i>Not relevant</i>	<i>Not relevant</i>	<i>No data</i>
	Inadequate stimulation and psychosocial care associated with delayed performance. Mildly and severely delayed performance: mental/cognitive = 34-36%, motor = 11-27%; mental and/or motor = 76% (n=3)	<i>Not relevant</i>	<i>Not relevant</i>	<i>Not relevant</i>	<i>Not relevant</i>	<i>Not relevant</i>	<i>No data</i>

rides.³⁰ The provision of these items are expected to be fulfilled when a person complies with the recommendations of consuming whole-grain cereals, legumes, fruits, and vegetables, i.e. >25 g/d of total dietary fiber. Potential health benefits of increased fiber consumption include the prevention of obesity, diabetes, cardiovascular diseases, and various cancers.

Based on those findings from studies conducted in the last 10 years, messages related to the following items are recommended to be included in the next version of the guidelines:

- Increased consumption of fiber;
- Moderate consumption of protein;
- Limitation of fats and oils, salt, sugar, and cholesterol. Choose unsaturated vegetable oils (e.g. sunflower,

corn) rather than animal fats or oils high in saturated fats (e.g. coconut and palm oil); limit consumption of processed meats that are high in fat and salts; use low- or reduced-fat milk and dairy products; avoid processed and fried foods that contain industrial trans fatty acids; cook and prepare foods with as little salt as possible; avoid foods with high salt contents; limit the intake of soft drinks and fruit drinks sweetened with sugars; choose fresh fruits for snacks instead of sweet foods;

- Example of serving sizes of the various food items, e.g. 1 serving size of: rice=3/4 glass=100 g=175 kkal; vegetable: 1 glass=100 g=25 kkal; fruit: 1-2 apples=50-190 gram=50 kkal; tempe=2 pcs=50 g=75 kkal; meat:

1 pc=35 g=75 kkal; oil: 1 tea spoon=5 g=50 kkal; sugar: 1 table spoon=13 g=50 kkal;

- Mandatory consumption of supplementation for specific age groups based on government program, e.g. vitamin-A capsules for children under the age of five, iron tablets for pregnant women. This information will increase awareness of the programs;
- The use of fortified food rather than iron-rich food. When relevant, that is locally available and consumed by the majority, nutrient-dense food and the examples should be provided, especially food sources of iron, zinc and calcium. The examples may be made specifically per province or island to allow for local food availability and food patterns of the community;
- The inclusion of suggested quantity of daily fluid consumption for the various age groups and physical needs, i.e. children min 1 liter, adult min. 2 liters, pregnant women min. 4 liters and lactating women min. 3 liters. Information of its sources, such as plain drinking water, juice, soup, can be mentioned.

Application of the above recommendations are in line with an example of alternative "Complementary Feeding Recommendation" (CFR) locally developed using an approach called "goal programming" for 9-11 month infants in Bogor, West Java.³⁸ Thirty-seven locally available nutrient-dense foods were specified in the CFR, as well as their portion sizes:

- Breast-feed daily on demand
- At least 3 staples/day, including: 1 serving/d of fortified infant cereal
- 5 servings/week of tempe (fermented soya bean) or tofu
- At least 3 servings/week of animal protein, including: 2 servings/week of chicken liver
- At least 1 serving/day of vegetables
- At least 2 servings/day of snacks, including: at least 2 servings/week of banana; 4 servings/week of fortified biscuits

Notes: Examples of portion sizes are: 1 serving of tempe=11 g, tofu=15 g; 1 serving of dry fortified infant cereal=20 g; 1 serving of chicken liver=5 g; 1 serving banana=51 g; 1 serving of fortified biscuit=7 g.

Specifically for children under the age of five, besides iron intake, intakes of zinc and calcium were consistently found as limiting in young children's diets, especially during the complementary feeding period.^{18,38} Unfortunately, current FBDG messages do not specifically address the need to increase nutrient density and intakes of nutrient-dense foods or foods fortified with these nutrients.

Non-food related issues

Smoking is very common in adolescent, adult, and the elderly, i.e. about one-third across age groups. About half (52%) of the people who smoke, can smoke up to 10 cigarettes per day, while another 41% can smoke up to 20 cigarettes.¹⁷ Hand washing is considered to be the primary control for disease transmission during food preparation.³⁹ In a study of urban mothers in Indonesia, washing hands are done before touching food and after defecation.⁴⁰ This is fewer than the suggested WHO recommendation, that is to wash hands before handling food, often

during food preparation, after defecation, and after attending children who have defecated.⁴¹ Mother's perception of the importance of hand washing appeared to be related to the concept of dirtiness (visible) rather than with germ theory (invisible). About one-third (36%) of mothers washed their hands without soap, because soap was regarded as cosmetic to remove odors, not as agent to remove microorganisms.⁴² Washing hands with soap can reduce the risk of diarrheal diseases by 42-47%,⁴³ however, in Indonesia's case, this practice can only be successful when it is based on current levels of knowledge and perception. The WHO Five Keys to Safer Food are: keep clean, separate raw and cooked, cook thoroughly, keep food at safe temperatures, use safe water and raw materials.³³

Messages related to the following items are recommended to be added in the next version of the guidelines:

- Specific advice on frequency and length of exercise, e.g. at least 5 days a week with 30 minute each, including examples of moderate physical activity;
- Not to smoke;
- Personal hygiene related to food safety. although the focus of dietary guidelines has shifted from sanitation and prevention of nutrient deficiency diseases to dietary excesses and prevention of non-communicable diseases, with the inclusion of lifestyle,² the focus in Indonesia should still include the importance of hand washing and hygienic food preparation, as also the focus of other Asian countries.^{25,27,29}
- Controlling body weight; including information on how to achieve the desired weight, healthy weight range, and the best way to loose weight, e.g. one should not loose more than 0.5 to 1 kg per week
- Age specific guidelines. A country should have one FBDG for the general population, however, guidelines for specific age groupings are equally important. Messages such as breastfeeding, eating breakfast, physical activity, and special needs, can be highlighted for specific age groups. Age specific guidelines currently available in some countries are for infant, toddlers, children, adolescents, pregnant and lactating mothers, and elderly. For children, responsive feeding and stimulation are of importance. For adolescence, adult, and the elderly, emphasize on intake of fruit and vegetables can be focused. Aspects such as beliefs and taboos, should be discussed for pregnant women and the elderly. These beliefs should be neutralized first before health care professionals introduce new knowledge.

Specifically for children under the age of five, data showed that responsive feeding and stimulation to encourage cognitive and motor developments were not well practiced by the caregivers.^{18,38} Table 3 summarizes recommendations proposed by the authors. FBDG messages need to be positive, simple, few in number, and targeted. They should be comprehensive enough to include information on quantity of food (portion), quality (variety), and action to be followed (e.g. exercise regularly, monitor nutritional status). Positive words such as use, you may, enjoy, use sparingly, promote, minimize, reduce, maintain, balancing, eat more, instead of "do not" shall be used. In a review of 28 dietary guidelines worldwide, common characteristics of the guidelines are: stressing the impor-

Table 3. Examples of dietary guideline messages for the general population and possible translation in specific age groups and locations

Guidelines	Age-specific recommendation	Local-specific recommendations
Enjoy Daily intakes of : rice/tubers/other carbohydrate source foods (3x/d) plant protein-source foods (1-3x/d) vegetables (1-3x/d) Five or more times per week intakes of: fruits animal protein (meat, fish, poultry) food or nutrient-dense foods which are source of iron, zinc, calcium Minimum intake of salt (<5 g/d or <1 teaspoon) and sugar	For 6-8mo: meal=2x/d and snack=1x/d For 9-11mo: meal=3x/d and snack=2x/d Food amount (tablespoon/day) = age in months How to encourage child to eat including feeding during illness (feeding responsiveness) Children under five: the importance of Fe, Zn, Ca, vitamin-A. Children: breakfast For pregnant women: eat adequately for a proper weight gain and healthy pregnancy; supplementation of folate and Fe. For lactating women: eat adequately for healthy lactation; For elderly: increase intake of antioxidants	Provide examples of locally-available nutrient-dense foods and recipes using those foods. When relevant, fortified foods can be recommended Provide portion size, preferably with standard as well as local household measure units
Use only iodized salts		
Breastfeed your baby exclusively for 6 months, then breastfeed on demand until 2 years. Avoid formula milk unless necessary		
Drink adequate quantities of fluid that are free from contaminants	5-8 years: 1 l/d (4 glasses) 9-12 years: 1.5 l/d ≥13 years: 2 - 4 l/d Pregnant women: min 4 l/d Lactating women: min 3 l/d	
Do physical activity regularly (5 or more times per week for 30 min)	For infants and young children: provide stimulation to encourage motor and cognitive development. For school children: do more physical activity	
Monitor weight to be in the ideal range and bring child for monthly growth monitoring		
Do not smoke		
Avoid drinking alcoholic beverages		
Prepare food hygienically and wash hands before food preparation, before eating/feeding child and after defecation		
Read the labels of packaged foods: notice expiry date look for vitamin and minerals in the content avoid food additives		

tance of variety and balance, promoting increase consumption of fruit and vegetable, advice on limiting salt, sugar, and alcohol, and suggestion to increase physical activity.⁵

SOCIALIZATION OF THE MESSAGES

The socialization of FBDG plays an important role in the success of its application by the public. Although outcomes may not be seen in the short time, longer term output will benefit future generations. Thus, the process shall start now. Combined efforts of scientists, professionals, government, non-government organization (NGO), industries, and the media contribute mutually. The government should establish inter-governmental collaboration for concerted actions involving food, agriculture, trade, health, education, information and environment. Creation of community consciousness programs will generate demand on nutrition knowledge. Professional organizations, NGOs, and the media can help disseminate the guidelines more widely. Professionals are responsible in translating the guidelines into actionable behavior change. The industries can contribute by producing and promoting healthy food, e.g. minimizing the use of harmful saturated

fats, high sugar, and salt; control advertising and marketing of “unhealthy” food products and misleading health claims.

The guidelines should be socialized to all age groups, with children as priority. Nutrition education to apply balance diet and physical activity should be introduced as early as possible.^{36,44-46} In a survey of 359 people, more than half (54%) mentioned that the socialization of FBDG is best through educational institutions, particularly elementary school (unpublished data). Naturally, the messages shall also be shared with the parents and the teachers. Real behavior change to address the obesity epidemic should focus on very young children and their parents.⁴⁷ Various advertizing materials such as leaflets, posters, booklets, handouts, books, slides, and transparencies can be provided to relevant institutions. Promotion by posters on city buses, newspaper, radio, and television can reach greater targets. From the same survey, 50% supported promotion by radio and television. Industries can help produce the materials.

Basic knowledge such as the knowledge on how to monitor body weight should be publicly known. For children, this possibility is open at the monthly weighing cen-

ters (locally known as *Posyandu*) available in the sub-villages. Provision of weighing scale for adult in these centers will improve access of mothers to the equipment. A handy children growth monitoring chart or table, Body Mass Index (BMI) calculator, and measuring length should be widely distributed to increase awareness to the various monitoring methods. Schools, women saving group, and religious gatherings can be used as promotion channels. Promotion of a lower BMI cut-off points for adult Indonesians, i.e. $>23 \text{ kg/m}^2$ for overweight, may be initiated. Asians generally have higher percentage of body fat than Caucasians of the same age, sex, and BMI^{48, 49} thus this lower cut-off may be a good early warning system.

Local context should be utilized in as many cases as possible, from choosing examples of food to practical solutions present in the villages. As a source of animal protein, dog may be accepted in North Sumatra and East Nusa Tenggara; likewise drinking blood in Papua, but not in other provinces. Local mosques or water pot traditionally used to wash hands and feet in Java-Lombok can be used by the community as water source for washing hands.

There are many terms used in describing the FBDG, such as dietary goals, daily food guide, dietary action guide, food guidance, and nutritional guidelines. For Indonesian use, the authors suggest the term nutrition guidelines or locally *Panduan Gizi Seimbang*. This would include messages related to food, personal hygiene, physical activity, and body weight. For pictorial representation of the guidelines, a design that is popular for children should be sought after so that messages in the guidelines can be easily understood by them. The concept of "enjoyment" can be introduced here. When children like it, the mothers and ultimately the parents will help disseminate the messages. In our quest for finding a slogan, the following top three group of words came up: balance diet or balance Nutrition (*locally Gizi Seimbang or berimbang*) 86%, healthy, fit, strong (*locally sehat, kuat, bugar*) 52%, and smart, achiever, better life (*locally cerdas, berprestasi, kreatif, mandiri, unggul*) 49% (n=292) (unpublished data). It is clear that the concept of a balance diet, physical health and quality of life are in the minds of the public.

Last but not least evaluation and re-evaluation of strength and weakness of the nutrition guidelines should be done regularly, at least every five years. Communities and other relevant stakeholders should be consulted to guarantee practicability and relevance to current scientific knowledge. Experience shows that a leading individual who foresee the whole process is essential. Similarly, political support to ensure its incorporation in government programs and commitment on resources are crucial.

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AUTHOR DISCLOSURE

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Review

Do Indonesians follow its Dietary Guidelines? - evidence related to food consumption, healthy lifestyle, and nutritional status within the period 2000-2010

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印尼人是否遵循飲食指南?在 2000-2010 年期間的食物攝取、健康生活型態和營養狀況回顧

飲食指南是一套建言給予大眾飲食的建議以增進營養福利。它們包含食物上的或行為的資訊，這些鼓勵或是警告的訊息是衍生自科學性實證及本土的特定情形。印尼飲食指南是由 13 項訊息組成，在 1995 年由衛生部公布；在那之後，它與民眾的營養狀態和健康結果之相關性從未被評估過。本篇文章回顧過去 10 年，在不同年齡層的研究，比較其結果與飲食指南的建議，目的為確認指南的訊息是否已成功的被應用及是否有相關的議題未被納入。這個回顧評估的研究涵蓋 33 個省份中的 29 個，代表次區級或是較高層級(區、省、全國)。結果顯示，一些訊息已被執行的比其它的好；但有某些訊息缺乏資料，無法斷定它被執行與否。此外，發現一些行為在幾個年齡層中是普遍的，且有重要的公共衛生後果，但是尚未包含在 13 項指南中。包括：抽菸、增加蔬果攝取、限制鹽及糖的攝取量、增加富含鋅及鈣(除了鐵)的食物攝取、食物製備及食用前先洗手，以及體重監測。對於嬰幼兒，營養密度、餵食反應及外在刺激應被特別注意。基於這些結果，提出幾項修訂飲食指南的建議。

關鍵字：飲食指南、印尼、食物攝取、健康的生活型態、營養狀況