

## Lifestyle Practices Predictors of Nutritional Status among Basic Public-School Children in Aden, Yemen

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### Abstract

**Introduction:** Since March 2015, children's nutrition in Yemen is increasingly threatened and acute malnutrition is now at serious levels across the country. This study aimed to determine the association between nutritional status and lifestyle practices of basic-public school children in Aden-Yemen.

**Methods:** A cross-sectional study was conducted in January 2022 on a randomly selected basic public schools' children aged 6-10 years. Lifestyle practices including breakfast consumption at home, physical activity, screen time and sleeping time were assessed by a self-administered questionnaire filled by the parents. Measurement of Z-score was done for height-for-age, weight-for-age and body-mass-index for-age to define stunting, underweight, thinness, overweight and obesity respectively. The data were processed and analyzed using SPSS-25 and World Health Organization's (WHO) Anthro plus program.

**Results:** The study involved 930 students having the following prevalence: 26.9% for stunting; 32.5% for underweight and 23.1% for thinness. In addition, 1.2% were obese and 3.2% were overweight. According to the binary logistic regression, children aged >8-10 years were more likely to be stunted (AOR=5.269; 95% CI:3.339-8.313), underweight (AOR=9.156; 95% CI: 5.631-14.890) and thin (AOR=3.901; 95% CI: 2.400-6.339) compared to younger age. Male children were more likely to be stunted (AOR= 1.496; 95% CI: 11.091-2.053), underweight (AOR=3.026; 95% CI: 2.195-4.172) and thin (AOR=8.001; 95% CI: 5.313-12.048) compared to female children. Less than daily consumption of breakfast increased the risk of stunting (AOR=1.505; 95% CI:1.109-2.042), underweight (AOR=4.724; 95% CI:3.421-6.524) and thinness (AOR=6.053; 95% CI:4.033-9.084) compared to daily breakfast consumption. Children sleeping < 9 hours was associated with increased risk of stunting (AOR=1.479; 95% CI:1.093-2.001) and thinness (AOR=1.548; 95%CI:1.102-2.176) than sleeping  $\geq$  9 hours. Additionally, increasing likelihood of overweight (AOR= 50.848; 95% CI: 6.211-416.301) and obesity (AOR= 8.977;95% CI: 1.098-73.422) was observed among children play outside < 1 hour compared to playing  $\geq$  1 hour. Furthermore, increasing risk of overweight was associated with children's screen time  $\geq$  2 hours compared to < 1 hours (AOR=12.034; 95% CI: 2.311-62.668).

**Conclusion:** Stunting, underweight and thinness are major nutritional problems among basic public-school children in Aden. Unhealthy dietary and bad lifestyle practices associated with malnutrition indicators. This calls for attention by policymakers to address the challenges of malnutrition and implementing urgent intervention for awareness raising to maintain healthy lifestyle among school children.

**Keywords** Nutritional Indicators, Lifestyle, Basic school, Students, Aden

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## ممارسات نمط الحياة المنبئة بالحالة التغذوية بين أطفال المدارس الحكومية الأساسية في عدن، اليمن

ندى محمد بادي و هدى عمر باسليم

### ملخص الدراسة

**المقدمة:** منذ مارس 2015، أصبحت تغذية الأطفال في اليمن مهددة بشكل متزايد، وسوء التغذية الحاد الآن في مستويات خطيرة في جميع أنحاء البلاد. هدفت الدراسة إلى تحديد العلاقة بين الحالة التغذوية وممارسات نمط الحياة لأطفال المدارس الأساسية الحكومية في عدن - اليمن.

**المنهجية:** أجريت دراسة مقطعية في يناير 2022 على أطفال المدارس الأساسية الحكومية المختارة عشوائياً الذين تتراوح أعمارهم بين 6 و10 سنوات. تم تقييم ممارسات نمط الحياة بما في ذلك تناول وجبة الإفطار في المنزل والنشاط البدني ووقت الشاشة ووقت النوم من خلال استبيان يعبأ ذاتياً من قبل الوالدين. تم قياس درجة Z بالنسبة للطول مقابل العمر والوزن مقابل العمر ومؤشر كتلة الجسم للعمر لتحديد التقزم ونقص الوزن والنحافة وزيادة الوزن والسمنة على التوالي. تمت معالجة البيانات وتحليلها باستخدام برنامج SPSS-25 و WHO Anthro plus.

**النتائج:** شملت الدراسة 930 طالب وطالبة، كان معدل انتشار التقزم 26.9% ونقص الوزن 32.5% والنحافة 23.1% بينهم. بالإضافة إلى ذلك، كان 1.2% يعانون من السمنة المفرطة، و3.2% يعانون من زيادة الوزن. وفقاً للانحدار اللوجستي الثنائي، كان الأطفال الذين هم في المجموعة العمرية الأكبر (< 8-10 سنوات) أكثر عرضة للإصابة بالتقزم (AOR=3.339-8.313; 95% CI: 3.339-8.313) ونقص الوزن (AOR=3.901; 95% CI: 2.400-) والنحافة (AOR=9.156; 95% CI: 5.631-14.890) مقارنة بالأعمار الأصغر (6-8 سنوات). بالإضافة إلى ذلك، كان الأطفال الذكور أكثر عرضة للإصابة بالتقزم (AOR= 1.496; 95% CI: 11.091-2.053)، ونقص الوزن (AOR=3.026; 95% CI: 2.195-4.172) والنحافة (AOR=8.001; 95% CI: 5.313-12.048) مقارنة بالإناث. عدم تناول وجبة الإفطار بشكل يومي زاد من خطر التقزم (AOR=1.505; 95% CI: 1.109-2.042) ونقص الوزن (AOR=6.053; 95% CI: 3.421-6.524) والنحافة (AOR=4.724; 95% CI: 4.033-9.084) مقارنة بالتناول اليومي لوجبة الإفطار. وبالمثل، فإن نوم الأطفال أقل من تسع ساعات يزيد من خطر التقزم (AOR=1.479; 95% CI: 1.093-2.001) والنحافة (AOR=1.548; 95% CI: 1.102-2.176) مقارنة بالنوم تسع ساعات أو أكثر. بالإضافة إلى ذلك، تزداد احتمالية زيادة الوزن (AOR= 50.848; 95% CI: 6.211-416.301) والسمنة (AOR= 8.977; 95% CI: 1.098-73.422) بين الأطفال الذين يلعبون خارج المنزل أقل من ساعة واحدة مقارنة باللعب ساعة وأكثر. علاوة على ذلك، فإن زيادة خطر زيادة الوزن مرتبط بزيادة وقت مشاهدة الشاشة ساعتين وأكثر مقارنة بأقل من ساعتين (AOR= 12.034; 95% CI: 2.311-62.668).

**الخلاصة:** التقزم ونقص الوزن والنحافة مشاكل تغذوية رئيسية لدى أطفال المدارس الأساسية الحكومية في عدن. ارتبطت الممارسات الغذائية غير الصحية وأسلوب الحياة السيئ بمؤشرات سوء التغذية. تدعو الدراسة صانعي السياسات إلى الاهتمام بمعالجة تحديات سوء التغذية، واتخاذ تدابير تدخل عاجلة لزيادة الوعي حول الحفاظ على نمط حياة صحي بين أطفال المدارس.

**كلمات مفتاحية:** المؤشرات الغذائية، أسلوب الحياة، التعليم الأساسي، الطلاب، عدن.

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## Introduction

The double burden of malnutrition is known to affect populations when under- and overnutrition coexist (DBM) [1]. Global Nutrition Reports 2018 state that one in three individuals are malnourished, one in twenty youngsters report feeling hungry, and one in five global fatalities are linked to inadequate food [2]. In low- and middle-income countries (LMIC), DBM is more common, with a larger frequency in the poorer LMICs. South-East Asia, the Pacific, and sub-Saharan Africa are the regions with the highest prevalence of it [3]. The progress in the reduction of the burden of malnutrition worldwide has been slow and it is therefore advised to collect population-specific data to better understand the nutrition dynamics across the world and to allow the nutritional needs of communities to be addressed adequately [4]. Trends in malnutrition in children over the age of five are a problem that isn't being addressed. The World Health Organization (WHO) reports 1.8 billion children to be in the age group of 5–15 years worldwide, with 90% of this population residing in LMICs [5].

Proper dietary behavior and adequate physical activities reduce the risks of hypertension, dyslipidemia, and metabolic syndromes [6]. Contextually, promoting physical activity, limiting excessive screen time, and encouraging sleep duration are meaningful approaches to adopt in improving physical fitness. Accordingly, improving physical fitness in children and adolescents is regarded as a significant factor in public health

promotion [7]. A relatively newer concept referred to as developmental origins of adult health and disease postulates that poor nutrition during the early phases of life is clearly associated with chronic illnesses in adulthood [8].

The current scarcity of data on school-going children and adolescents and now, with the increase in child survival rates, the number of children entering their second decade is increasing and their health and nutritional needs compel attention [9]. Therefore, the aim of this study is to assess nutritional status and lifestyle practices including breakfast consumption at home, physical activity, screen time, and sleeping time among basic public-schools' children, Aden especially during the protracted conflict in Yemen.

## Methods

### *Study design and setting*

Community-based cross-sectional survey was conducted in January 2022 in a randomly selected basic public-schools within the four districts (Al-Tawahi, Khurmaksar, Al-Mansoura, and Dar Saad) from Aden governorate in Yemen.

### *Target population*

The target population (respondents) includes children aged between 6 and 10 years residing in Aden for at least two years, they don't suffer from chronic illness or congenital diseases and whose parents provided their consents to participate in the study.

**Sampling**

The sample size was calculated using a single population proportion formula [10]. Based on the assumption of an unknown proportion of malnutrition indicators among basic-public school children in Yemen, 50% was used to attain a maximum sample size. The following assumptions were made to determine the required sample size: (i) proportion of the population 50%,  $p = 0.50$ ; (ii) Two-sided standard Z-score  $Z_{\alpha/2} = 1.96$ ; corresponds to a 95% confidence interval; (iii) Margin of error/relative precision  $d=0.05$  (5%); and (iv) Design effect  $D=2$  (to adjust for the multistage sampling technique) and contingency for nonresponse rate = 20%.

Thus, the sample size  $n = [Z^2 \alpha^2 p (1 - p) / d^2] \times D = [(1.96)^2 \times (0.50 \times 0.50) / (0.05)^2] \times 1.2 = [3.8416 \times 0.25 / 0.0025] \times 2 = 384 \times 2 = 768$ . After adding 20% to compensate for the nonresponse, the sample size was rounded to 930 children. A multistage stratified random sampling method was used: ***In the first stage***, the sample districts were selected by a simple random sampling to include 50% of the 8 districts in Aden. ***In the second stage***, one mixed basic public-school from each of the four districts was selected randomly. ***In the third stage***, one class from each level in the school was randomly chosen in the selected schools. The children were selected from each school record by the systematic random sampling technique.

**Data collection**

A structured questionnaire was developed and was self-filled by the parents. The questionnaire items were retrieved from previously published relevant studies. Pretest was done on 5% of sample out of non-sampling

areas, and necessary correction was made on the clarity of language, the sequence and work ability of questionnaire.

Anthropometric measurements such as weight, height, were taken using the standard operating procedures. Weight was measured to the nearest 0.1 kg in a standard weighing scale which was standardized time to time during the data collection. Children were instructed to stand on the balance with light clothing and without footwear and with feet apart and looking straight. A stadiometer (measuring rod) capable of measuring to an accuracy of 0.1 cm was used to assess height of the subjects. The subject was made to stand without footwear with the feet parallel and with heels, buttocks, shoulders, and occiput touching the measuring rod, hands hanging by the sides. The head was held comfortably upright with the top of the head making firm contact with the horizontal head piece [11].

For assessing the nutritional status, Z-score of the body mass index (BMI) for age was calculated using WHO growth reference standards separate for boys and girls. Children were categorized as normal, overweight, and thinness according to BMI for z-score. The definitions used for the study were as follows: (1). Normal: BMI for age z-score of  $< +1SD$  to  $-2SD$  (2). Overweight: BMI for age z-score of  $> +1SD$  (3). Obesity: BMI for age z-score of  $> +2SD$  (4). Thinness: BMI for age z-score of  $< -2SD$ . Additionally, Z score was used for low height-for-age  $< -2SD$  (stunting), low weight-for-age  $< -2SD$  (underweight) [12].

**Statistical analysis**

The collected data were coded onto a separate coding sheet. Data were processed and analyzed by using SPSS (25) and WHO Anthro plus program (version 3.2.2, January 2011). For qualitative analysis, rates were calculated for the prevalence of stunting, underweight, normal weight, thinness, overweight and obesity. To identify the predictors of the nutritional indicators, the binary logistic regression was performed to obtain adjusted odds ratios (AOR) and 95% confidence intervals (95% CI) for statistical associations. The dichotomized variables were used in the bivariate analysis as independent variables and recoded into "1" (8-10 years, male, physical activity < 1 hour, screen time > 2 hours, time sleep/day < 9 hours). The reference category of the variables (the least risky group) was equal to "0" (6-8 years, female, physical activity ≥ 1 hours, screen time ≤ 2 hours, time sleep/day ≥ 9 hours).

**Ethical considerations**

Approval to conduct the study was obtained from the Research Ethics Committee of the Faculty of Medicine and Health Sciences, University of Aden (Research Code: REC-113-2022). Permission to conduct the study was obtained from the Director General of the Office of Education, Aden Governorate, who in turn wrote instructions to all principals of the selected schools to ensure full cooperation. Prior to the study, information was sent to the participant and confidential letters to the parents of the study sample from the researcher to obtain written consent. The letters included questionnaires and informed consent. All data collection sheets were kept

confidential and their identity was not revealed.

**Results**

As demonstrated in Table 1; 26.9% of children were stunted, 32.5% were underweight. On the other hand, the majority had normal BMI for age z score (72.5%) compared with 3.2% overweight, 1.2% obese and 23.1% thin children

**Table1:** Prevalence of Nutritional Status Indicators among Basic-public School Children in Aden (n=930)

Nutritional status	No.	%
Stunting	250	26.9
Underweight	302	32.5
<b>BMI Z score</b>		
• Thinness	215	23.1
• Normal	674	72.5
• Overweight	30	3.2
• Obesity	11	1.2

From 930 consented children's parents, 466 were males (50.1%) and 464 females (49.9%) basic public-school children participated in the study. Almost two-thirds of children (66.7%) aged more than 8-10 years with a mean age 8.49 (±SD 1.1) years. In addition, slightly more than half of children (53.9%) declared consuming breakfast less than daily and 46.1% consumed breakfast on daily base. Furthermore, the highest percentage of children had time-play outside for one hour or more (52.2%), screen time less or equal than two hours (67.5%) and sleeping between nine to twelve hours per day (47.7%).

**Table 2:** Children Characteristics, Aden Basic-Public Schools (n=930)

Characteristics	No.	%
<b>Age</b>		
6-8	310	33.3
>8-10	620	66.7
Mean ( $\pm$ SD)	8.49 ( $\pm$ 1.1)	
<b>Gender</b>		
Male	466	50.1
Female	464	49.9
<b>Consumption of breakfast at home</b>		
Less than daily	501	53.9
Daily	429	46.1
<b>Time-play outside</b>		
< 1 hour	445	47.8
$\geq$ 1 hours	485	52.2
<b>Screen time e.g. T.V, Games, Telephone</b>		
$\leq$ 2 hours	628	67.5
> 2 hours	302	32.5
<b>Time sleep/day</b>		
< 9 hours	354	38.1
9-12 hours	444	47.7
>12 hours	132	14.2

Table 3, shows increasing stunting risk of nearly five folds among children of older age (>8-10 years) compared to younger age (6-8 years) (AOR= 5.269; 95% CI: 3.339-8.313). Likewise, a higher risk of having stunting was found among male children (AOR=1.496; 95% CI: 11.091-2.053) compared to their respective female children peers. Less than daily consumption of breakfast increased the risk of stunting about one-half than daily consumption of breakfast at home (AOR=1.505; 95% CI:1.109-2.042). Similarly, children sleep less than nine hours increased the risk of stunting one and half than sleeping nine hours and more (AOR=1.479; 95% CI:1.093-2.001). For underweight, increasing the risk about nine folds was noticed among children of older age (>8-10 years) relative to those with younger age (AOR=9.156; 95% CI: 5.631-14.890). Nearly three folds of the risk of underweight was observed among

male children (AOR=3.026; 95% CI: 2.195-4.172) compared to their respective female children. Less than daily consumption of breakfast increased the risk of underweight about five times than daily consumption of breakfast at home (AOR=4.724; 95% CI:3.421-6.524). For thinness, increasing the risk nearly four times higher among children with older age (>8-10 years) compared to those of younger age (6-8 years) (AOR=3.901; 95% CI: 2.400-6.339). Male children had eight times higher odds of thinness compared to female children (AOR=8.001; 95% CI: 5.313-12.048). Less than daily consumption of breakfast increased the risk of thinness about six times than daily consumption of breakfast (AOR=6.053; 95% CI:4.033-9.084). On the other hand, sleeping less than nine hours increased the risk of thinness than sleeping nine hours or more (AOR=1.548; 95% CI:1.102-



2.176). Furthermore, increasing the likelihood of overweight was observed among children play outside less than one hour compared to playing equal and more than one hour (AOR= 50.848; 95% CI: 6.211-416.301). Additionally, twelve times increased risk of overweight associated with children's screen time

equal and more than two hours compared to less than two hours (AOR= 12.034; 95% CI: 2.311-62.668). Increasing risk of obesity about nine folds was noticed among children playing outside less than one hour compared to playing equal and more than one hour (AOR= 8.977; 95% CI: 1.098-73.422).

**Table 3:** Predictors of Nutritional Indicators of Basic Public- Schools Children in Aden

Predictor		P	AOR	95% CI
<b>Stunting</b>				
<b>Age</b>	6-8*	<0.001	1.00	-
	>8-10		5.269	3.339-8.313
<b>Gender</b>	Female*	0.012	1.00	-
	Male		1.496	1.091-2.053
<b>Consumption of breakfast intake</b>	Less than daily	0.009	1.505	1.109-2.042
	Daily*		1.00	-
<b>Time sleep/day</b>	< 9 hours	0.011	1.479	1.093-2.001
	≥ 9 hours*		1.00	-
<b>Underweight</b>				
<b>Age</b>	6-8*	<0.001	1.00	-
	>8-10		9.156	5.631-14.890
<b>Gender</b>	Female*	<0.001	1.00	-
	Male		3.026	2.195-4.172
<b>Consumption of breakfast intake</b>	Less than daily	<0.001	4.724	3.421-6.524
	Daily*		1.00	-
<b>Thinness</b>				
<b>Age</b>	6-8*	<0.001	1.00	-
	>8-10		3.901	2.400-6.339
<b>Gender</b>	Female*	<0.001	1.00	-
	Male		8.001	5.313-12.048
<b>Consumption of breakfast intake</b>	Less than daily	<0.001	6.053	4.033-9.084
	Daily*		1.00	-
<b>Time sleep/day</b>	< 9 hours	0.012	1.548	1.102-2.176
	≥ 9 hours*		1.00	-
<b>Overweight</b>				
<b>Time-play outside</b>	< 1 hours	<0.001	50.848	6.211-416.301
	≥ 1 hours*		1.00	-
<b>Screen time</b>	≤ 2 hours*	0.003	1.00	2.311-62.668
	> 2 hours		12.034	-
<b>Obesity</b>				
<b>Time-play outside</b>	< 1 hours	0.041	8.977	1.098-73.422
	≥ 1 hours*		1.00	-

\* Reference category, AOR: Adjusted Odds Ratio, CI: confidence intervals

## Discussion

The purpose of this study is to provide data on the prevalence of stunting, underweight, thinness, overweight, and obesity, among basic public-school children aged 6–10-years and lifestyle predictors including breakfast consumption at home, play outside, screen time and, sleeping time in Aden Governorate.

In the current study, the results showed the following nutritional indicators: 26.9% for stunting, 32.5% for underweight and 23.1% for thinness. However, some studies showed lower prevalence such as a study conducted in Jordan (2016) with stunting at 4.9 %, and underweight at 5.7% [13], whereas a Northern Sudan study (2018) with a percentage of 3.8% for stunting, 4.6% for underweight, and 3.7% for severe underweight [14]. The socioeconomic status of the participants may explain why the nutritional indicators in the current study were generally worse than comparable figures in other studies.

The binary logistics regression in the current study confirmed that males' children were more likely to be stunted (AOR=1.496; 95% CI: 11.091-2.053), underweight (AOR=3.026; 95% CI: 2.195-4.172) and thin (AOR=8.001; 95% CI: 5.313-12.048) compared to females' children. Similar trend was found in Southern Ethiopia (2018), with higher prevalence of stunting among males (47.4%) compared to female (36.4%) [15] and higher prevalence of thinness among males in Egypt (2019)

(4.6%) compared to females (3.3%) [16]. Gender differences can be attributed to developmental trajectories and immune function that begin in the womb which may increase the risk of infections and nutritional deficiencies in boys. Boys are often more active than girls. Moreover, growth and development of males is affected by environmental and nutritional stress (including common childhood diseases) more than that of females, which makes males more vulnerable to chronic undernutrition [17].

The binary logistics regression in the current study illustrated that children who had older age group (>8-10 years) were more likely to be stunted (AOR= 5.269; 95% CI: 3.339-8.313), underweight (AOR= 9.156; 95% CI: 5.631-14.890) and thin (AOR=3.901; 95% CI: 2.400-6.339) compared to younger age (6-8 years). As previously confirmed increasing age requires higher nutrients to support the continuous growth before adolescence; therefore, school children who have insufficient food intake suffered from a reduction in body weight. Further, older children are already transitioning to puberty, where numerous inimitable challenges occurred, including higher body requirements, making them more susceptible to wasting [18].

For breakfast consumption, children's who ate their breakfast less than daily were more likely to be stunted (AOR=1.505,95% CI=1.109-2.042), underweight



(AOR=4.724, 95% CI=3.421-6.524) and thin (AOR=6.053, 95% CI=4.033-9.084) than those who ate their breakfast daily. This is in alignment with what was reported from Egypt (2019) with those rarely/never having breakfast consumption was linked with higher percentage of stunting, and thinness [16]. This might be because breakfast consumption is an important remedy to obtain adequate calorie intake throughout the day [11].

For sleeping time, the current study shows children who sleep less than nine hours were more likely to be stunted (AOR=1.479; 95% CI:1.093-2.001) and thin (AOR=1.548; 95% CI:1.102-2.176) than those who sleep equal and more than nine hours. This could be explained by that: the pituitary gland growth hormone is a key player in these events. Several factors affect its production, including nutrition, stress, and exercise. In young children, the most important factor is sleep. Growth hormone is released throughout the day. However, the most intense period of release is shortly after the beginning of deep sleep. Without adequate sleep, growth problems – mainly slowed or stunted growth – can result [19].

In this study, the prevalence of overweight and obesity in basic public-school children in Aden is 3.2% and 1.2% respectively. These figures share some similarities and differences with local, regional and developing country indicators. Locally, studies were conducted in Aden (2009) [20] and Mukalla (2018) [21] which reported higher

prevalence than what is identified in the present study. In Aden; prevalence of overweight was 12.6% and the prevalence of obesity was 8% [20] whereas in Mukalla; the prevalence of overweight was 17.2% and the prevalence of obesity was 11.3% [21]. In neighboring countries, high figures in the spectrum of overweight and obesity among school children was reported in Kuwait in 2016 (21.6% and 30.5% respectively) [22]. Differences in the percentages of overweight and obesity between the current study and other studies could be explained by continuation of the war in Yemen associated with economic decline and high food prices in addition to genetic and dietary variation. A study in Oman in 2020 did not find significant association between physical activity time and overweight or obesity [23]. On the contrary, the present study showed that there was a statistically significant strong inverse relationship between less than one-hour physical activity and overweight or obesity. The binary logistics regression in the current study further affirmed that children whose playing outside was less than one hour were more likely to be overweight (AOR=50.848; 95% CI: 6.211-416.301), and obese (AOR=8.977; 95% CI: 1.098-73.422) compared to children who play outside more than one hour. This finding is in agreement with Baran *et al.* (2020) who reported that the risk of overweight/obesity was greater in children having less than one hour of physical activity [24].

The binary logistic regression of the present study revealed that children whose screen time was more than two hours were at more risk of overweight (AOR=12.034; 95% CI: 2.311-62.668) compared to less than or equal two hours. This finding is different from the Omani study (2020) which did not find significant association between time spent in watching television and overweight or obesity [23] while it is in agreement with some of the studies which reported increased overweight and obesity among high-screen users. For example, a study in China (2020) among 2201 Chinese children reported increased odds of obesity for those with more than 2h of screen time per day [25]. The current study finding can also be connected to the role of advertising from TV, and its influence by the thousands of commercials seen each year, such as junk food, fast foods, kids' films, cartoon films and toys resulting in high interest in children to enjoy themselves without performing any important activities as reading, schoolwork, playing outside, exercise, family interaction and social development, this lead to more excess weight in children [26].

### Conclusion

Basic-public school children in Aden Governorate have in general lower height and weight in relation to the WHO growth standards for this age group .Underweight, stunting and thinness are the major nutritional problems among basic public-school. Unhealthy dietary and bad lifestyle practices

associated with malnutrition indicators. For that efforts should be coordinated and programs should be implemented for the prevention and management of all malnutrition forms.

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