Are Obesity Levels Increasing in the "Transition Countries?"

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ABSTRACT--*In recent years, obesity and overweight has been recognized as a rising public issue in all countries in the world, especially among Middle-Eastern countries. From 1980 when the prevalence of obesity more than doubled, individual studies have been published. However, no evidence is collated on the overall problem in Middle East. Objective: to systematically review the prevalence of obesity/overweight in Middle East region. Methods: a systematic review of studies, which measured prevalence of obesity/overweight in countries of Middle East. Results were given separately for women/men and urban/rural participants. Results: In this review, ten studies were selected and included. All studies were conducted in Middle East countries in different time periods. Final analysis showed that overall, prevalence of obesity and overweight are increasing trend in this region. In addition, it was demonstrated that females are more overweight and obese. 31-59 age groups had the highest prevalence of obesity/overweight among both sexes. Urban participants are more obese and overweight than rural. Conclusion: Prevalence of obesity and overweight has increasing trend in Middle East Region. That is why; governments of this region should develop special programs and actions, which will consider specific cultural and social barriers of Middle East.*

Keywords-- *obesity, Middle East countries, Transition countries, overweight, Arab states of the Persian Gulf.*

I.   INTRODUCTION

Obesity/overweight is a state associated with abnormal or excessive fat accumulation affecting children as well as adults. In society, obesity is now a common state that it is replacing more traditional public health issues, such as infectious diseases and malnutrition (WHO, 2018a).

In 2013, a systematic review by Weston K et al. demonstrated that people with diabetes have a higher risk for fracture compared to people without diabetes, and obesity is a risk factor (Weston, Wisløff, Coombes, 2013).
Also, obesity is a risk factor for mortality from cardiovascular disease (CVD), mainly from heart disease and stroke, which were the leading cause of death in 2014 (WHO, 2017).

In 2014 (Al Hadad, 2014), Al Hadad investigated the prevalence of colon cancer among obese people. He found that the prevalence of colon cancer was 2.1 per cent higher for participants, who had BMI>30 kg/m^2.

The study by Kelly D. (2015) showed that obesity has a negative association with testosterone production. Changes in body mass have a greater impact on testosterone than even age. However, low testosterone leads to a

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further accumulation of fat mass. In 2016, a study was conducted among Iranian teenagers in order to investigate the associations between body image and actual body index (BMI) (Kelishadi et al., 2016). Life satisfaction and self-rated health were included as independent mortality and morbidity factors. In this study, almost 40 per cent of participants misperceived their body image. Misperception as overweight/ obesity was associated with low odds for life satisfaction and self-rated health. Overall, more than 1.9 billion adults, 18 years and older were overweight in 2014.Of these, over 600 million were obese. The prevalence of obesity is higher among women (15 per cent) than men (11 per cent). (WHO, 2018a).

Bogardus C. and Swinburn B. in 2017 suggested (Bogardus, Swinburn, 2017) that if the prevalence of obesity continues to rise, then by 2030 half of the world's adult population will be obese or overweight.

The prevalence of obesity is becoming a public issue in developing (transition) countries as shown in the figure below (Figure 1) (OECD, 2019). Transition countries are a group of countries, which are changing their economy from a centrally planned to a market-based. The transition process includes several changes, but the most important is economic liberalisation. The prices are set by market forces rather than by a central planning organisation. According to the World Bank List of Economies (2004) there are 70 transitional countries. In the Middle East, transition process started in 1945 with mass oil production in several countries (Iran, Kuwait, Iraq, the United Arab Emirates and Saudi Arabia). The Middle East region includes 17 countries with different economic development. A rapid economic transition process has led to a dramatic increase of obesity level within a few generations and reaching epidemic level in this region.
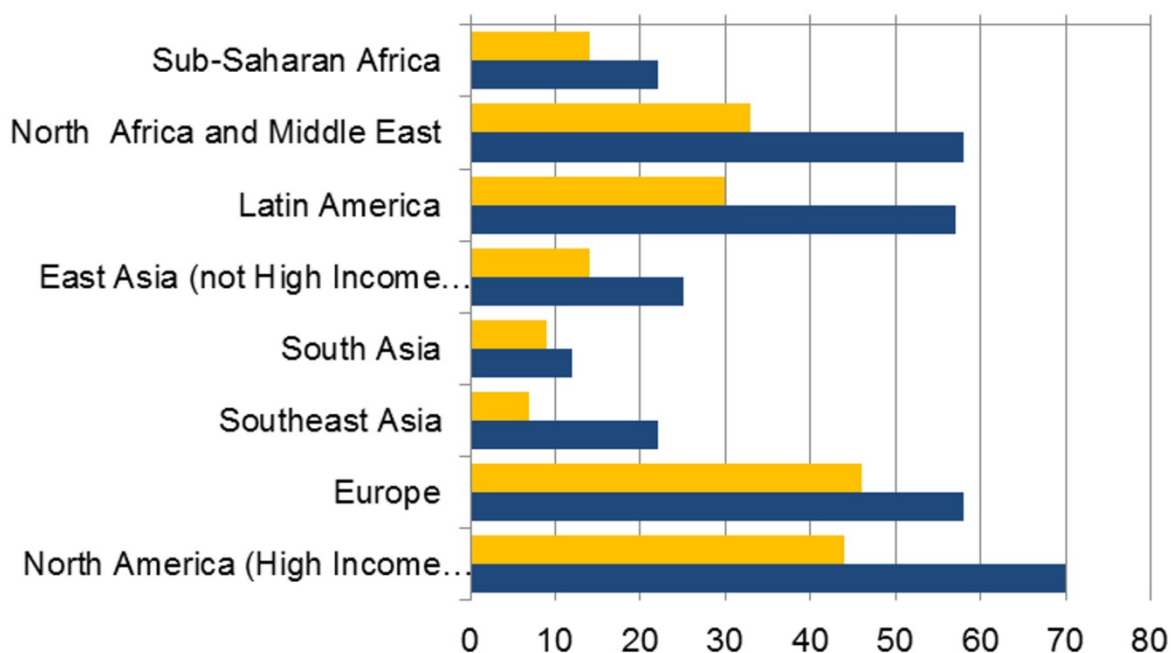

Figure 1: Percentage of overweight and obese with BMI>25, by region

Source: Organisation for Economic Co-operation and Development (OECD), 2019

In terms of levels of overweight and obesity, the Middle East is on the second place after North America (high income countries).

According to the data of the WHO (2018a) the prevalence of obesity in Middle East region is higher among women than men. For instance, in Saudi Arabia only 28 per cent of men and more than 44 per cent of women were obese. In Kuwait, the level of obesity is 36 per cent for men and 48 per cent of women. In Palestine, the prevalence of obesity also was high at 41 per cent (49 per cent and 30 per cent in women and men, respectively).

In 2014, the study of Musager (Musager et al., 2014) tried to investigate different barriers to weight maintenance among students in Kuwait by obesity levels and gender. The main barriers to physical activity and healthy eating were "Not having time to prepare or eat healthy food", "Do not have skills to plan, shop for, prepare or cook healthy foods", "Not having time to be physically active" and "The climate is not suitable for practicing exercise". These barriers were the same for both genders. Obese participants were more likely to face with all these barriers than non-obese.

The aim of this study is to systematically review the prevalence of obesity in Middle East region.

Factors Impacting Obesity Prevalence in Middle East

During last 20 years, it was a massive transition process in the Middle East due to social, demographic and economic changes (United Nations, 2018). There are four main trends influencing the transitions processes: globalization; urbanization; biopsychosocial and technological advancements. All these trends have led to new nutrition characteristics: monotonous diet, which was high in fiber previously, has changed to varied diet which is high in fat; alcohol and sugar. The main factors, which had impacted on these changes, are speedy urbanization, the rapid changes in the demographic characteristics of the Middle East region, social development in the absence of steady and significant economic growth. For instance, the real GDP growth has increased in this region from 2.8 in 2009 to 4.5 in 2016 (The World Bank, 2017). In 2015, the largest Middle East economies were in Saudi Arabia; Iran and Turkey (The World Bank, 2016). Around 20 per cent of known oil reserves and production are in Saudi Arabia and a national GDP is $657 billion. The economy of the United Arab Emirates is the second after Saudi Arabia with a GDP of $377 billion.

At the same time, within all these trend changes the highest dietary energy excess was seen in the Middle East. In spite of this recognition, a qualitative study by Ibrahim (Nair, Sheikh, Ibrahim, 2019) showed that obesity/overweight issue is under-treated and under-recognised in Middle East. While 32 per cent and 66 per cent of participants met all the criteria for obesity and overweight respectively in the United Arab Emirates (UAE), only 9 per cent of patients had recorded BMI or obesity (overweight) in their medical records. 6 per cent of participants were directed to a nutritionist and only for 6 per cent were offered physical activity and diet advice. It was reported that local doctors and physicians had sufficient knowledge, but lacked training in obesity management and adequate time for counseling. The findings confirmed that it is necessary to develop not only interventions, which promote lifestyle changes, but also programs, which help to decrease the gap between optimal obesity management recommendations and the current practices of their trainees (Ibrahim, 2015).

Another possible factor is biopsychosocial advancement. In most of the Arab countries, being overweight /obese is a symbol of beauty, fertility and sign of a social status. The systematic review (Fakhrzadeh et al., 2016) among Iranian adults demonstrated that Iranian women may have less physical activity level than men. This is because of

limited access to sport activities due to social and religious conditions. Consequently, Internet and TV became the main leisure activity. In Middle East, almost 99.5 per cent of women do not exercise (WHO, 2018a). Also, high fertility rate, especially multiple pregnancies and genetic predisposition for women can be potential risk factors. It is necessary to note that very hot climate of this region has a great impact on physical activity among people. For example, during summer period the temperature can reach 49' C and the blazing sun makes it impossible and undesirable to spend time outdoors. It can be a reason for the low level of sports and exercise activities. Religion and social features of Middle East has impact on education level among women. In Kuwait (Weiderpass et al., 2019), the prevalence of obesity was higher among women with a primary education level. In addition, high income level families, especially in Kuwait, Saudi Arabia and United Arab Emirates (UAE) prefer to employ cooks and maids leading to high level of obesity among women. Moreover, smoking can be associated with a lower BMI. The systematic review (Abou et al., 2015) of prevalence among Iranian adults demonstrated that smoking rate was higher among men (28.1 per cent) than women (5.8 per cent). It can explain a lower prevalence of obesity/overweight among Arab men.

Another factor is a rapid urbanisation process in Middle East. Urban people are more obese. The reason can be that urban residents are more likely prefer to eat western type of food, which is full of sugar, fat and alcohol. Also, urban people are less physically active due to the use of all technological advancements. For instance, in Kuwait the obesity level is higher in the East/North and around the capital city. However, in the West of Kuwait, the prevalence is lower due to mountains and deserts, and is less economically developed. Also, many studies indicate that married people are more susceptible to being overweight and obese (Vats, 2017).It is possible, because usually married couples are less active and used to eat together. The study by Taguri et al. (2009) in five Arab countries (Djibouti, Libyan Arab Jamahiriya, Morocco, Syrian Arab Republic and Yemen) showed that overweight ranged from 8.9 per cent in Yemen to 20.2 per cent in Syrian Arab Republic. For obese adults risk ratio (RR) ranged from 2.14 in Djibouti to 3.85 in Libyan Arab Jamahiriya. Also, they found that stunting can be a potential risk factor for obesity, because risk ratio (RR) ranged from 0.76 in mildly stunted adults of Yemen to 7.15 in severely stunted adults in Libyan Arab Jamahiriya.

It can be seen that in recent years, obesity and overweight has been recognized as a rising public health problem in all countries in the world, especially among Middle-Eastern countries. Since it is increase from the 1980s when the prevalence of obesity more than doubled, several individual studies have been published. However, no evidence is collated on the overall problem in Middle East. Moreover, in some countries (Iran, Oman, and Tunis) there was limited information about the prevalence of overweight in adulthood before 2007. The aim of this study is to systematically review the prevalence of obesity in Middle East region.

II.   METHODS

The main aim of this research project is to systematically review the prevalence of obesity in Middle East Region.

The objectives of this systematic review were to investigate possible differences between the prevalence of obesity and demographic trends such as: gender, age groups, rural/urban areas, education status, countries (in Middle East).

Clinical Effectiveness Review

Inclusion criteria

i) Types of studies for review;

This systematic review included only full text, English language studies for any primary study design from Middle East region.

ii) Population/participants;

Target population/participants were adults, living in the Middle East region.

iii) Outcomes.

Primary outcomes: prevalence of obesity in the Middle East, any possible associations with demographic trends.

Exclusion criteria

The review will exclude studies that do not report prevalence of obesity. Abstracts, conference proceeding, letters, editorials or opinion articles will be also ineligible for inclusion in the systematic review. Also, studies in developed countries, which had a population from the Middle East region, were excluded.

Search strategy

A robust search was conducted for all published studies from two electronic databases: Embase and MEDLINE. The search was limited from 1980 till 2016, because during this time period worldwide prevalence of obesity more than doubled (WHO, 2018b). MESH Subject headings and text words were used for obesity, Middle East and prevalence including truncation symbols $ and "adj".These were appropriately combined with Boolean operators OR/AND to identify relevant citations.

Data Management Process

After the search process, all citations were exported to Refworks and duplicates were removed. Using a checklist of inclusion/exclusion criteria, the systematic reviewer screened all the abstracts and titles of citations in order to identify relevant studies and in the process excluded any unsuitable studies. Secondly, for relevant studies, the reviewer read full text versions and identified the potentially eligible studies using an Eligibility Screening form.

Data Extraction strategy

For data extraction a special data extraction form was developed and piloted for this review. Data extracted were: study characteristics such as aims/objectives of the study, study design, participant's inclusion/exclusion criteria, participant's baseline characteristics such as age, gender, socioeconomic status, prevalence data and associations with demographic trends (if available).

Quality and Equity Assessment of included studies

A validated quality assessment tool called EPHPP (Effective Public Health Practice Project) tool for quantitative studies was used in order to assess the quality of included studies. Two reviewers independently assessed the quality of a few included studies before reaching a consensus agreement. Microsoft Excel 2013 and SPSS 17 were used for data analysis.

Four out of six studies reported the prevalence by age groups. However, these grouping were all different within each study. For this review, all participants were divided into three categories (<30, 31-59, >60) to highlight OW/obesity levels in younger, middle age and older populations in similar groupings. In addition, some studies reported prevalence of overweight and obesity separately. For these studies OW/obesity levels were combined to get overall rates, guided by appropriate formulae (Sutton AJ et al., 1998).Data was also analyzed according to the gender of participants as presented in the papers. After this, IBM SPSS was used to build forest plots for gender and age groups.

For the analysis of the settings (urban/rural), one study provided prevalence of urban and rural areas (Abdul-Rahim et al., 2003). One other study in Turkey was a systematic review which had prevalence data for obesity, some at a national level and some among cities. For this review, only the urban data from this study was considered for analysis. Where confidence intervals were not provided, these were calculated (Sutton et al., 1998). The data from urban rural setting were similar which yielded to meta-plot. Random effects method was used for this review.

Finally, results of the other studies where obesity was assessed as a risk factor for health conditions are presented as descriptive analysis.

III. RESULTS

Overall, 456 citations were identified (137-MEDLINE; 319- Embase) following the search. After removing all duplicates through Refworks, there were 208 articles. Titles and abstracts were screened and 11 full text studies were selected for critical appraisal. One study was excluded because it was conducted in a developed country (Sweden) with women from the Middle East Region and hence did not meet the inclusion criteria and 10 studies were included in the review (Bjermo, Lind, Rasmussen, 2015).

Number and type of included studies

All included studies were divided into two groups: studies, which measured the prevalence of obesity in the Middle East Region (six studies) (Abdul-Rahim et al. 2003; Al-Nuaim et al., 1996; Al-Lawati, Al Riyami, Mohammed, Jousilahti, 2002; Erem, 2015; Musaiger, 1995; Sibai, Hwalla, Adra, Rahal, 2003) and the studies that assessed obesity as a risk factor for various health conditions (four studies) (Weiderpass et al., 2019; Abou, Salameh, Nasser, Nasser, Godin, 2015; Vats, 2017; El Taguri et al., 2009; Weiderpass et al., 2019; Abou, Salameh, Nasser, Nasser, Godin, 2015; Vats, 2017; El Taguri et al., 2009).

All the six prevalence studies were conducted in the Middle Eastern countries from 1995 till 2015. The earliest cross-sectional studies were conducted in 1995 in Saudi Arabia (Al-Nuaim et al., 1996) and United Arab Emirates

(Musaiger, Radwan, 1995). Study in United Arab Emirates included only university female students (n=215). In contrast, study in Saudi Arabia included larger population of both sexes (n=13,177). Chronologically, the next study, which measured prevalence of obesity/overweight, was done in Palestine in 2003 (Abdul-Rahim et al., 2003). Studies conducted by Sibai et al (Abla Mehio Sibai, 2003) in Lebanon (Sibai, 2003) and by Al-Lawati et al. (2002) in Oman (Al-Lawati, 2002) were conducted in 2002. The latest and the most modern cross-sectional study were conducted in Turkey in 2015 (Erem, 2015).

Four studies which assessed obesity as a risk factor were conducted much later in the Middle East from 2005 till 2013.These studies considered different health conditions, different groupings and measurements but assessed obesity as a risk factor. Consequently these could not be combined in a meta-plot. The reasons for the differences are given below:

The study conducted by A. Esteghamati et al (Esteghamati et al., 2009) included different age groups of participants, which were not possible to include in a final meta-plot analysis. The study by Nasser M. Al-Daghri and colleagues (2013) did not measure prevalence of obesity and overweight, but reported only BMI of females and males, with and without metabolic syndrome. In the study conducted by Bouguerra R. and colleagues (2006), the average BMI among rural/urban women and men were described. The latest study (Hajat, Harrison, Shather, 2012) did not report number of participants in each age group. The results were given as a descriptive analysis.

Obesity as risk factor for health conditions

Four studies measured obesity and overweight as a possible risk factor for a health condition. These studies will be reported in a descriptive way.

In the study by Esteghamati et al (2009) the aim was to present the latest prevalence rates of non-communicable diseases (NCD) and their risk factors among Iranian population. Risk factors, which were associated with NCD were the prevalence of diabetes, hypertension, obesity, and central obesity. Authors divided participants into two groups: having known diabetes mellitus (KDM) and newly diagnosed diabetes. If a doctor had ever diagnosed diabetes, participant was included to the first group (KDM). In a group without KDM, fasting plasma glucose (FPG) of 126 mg/dl was determined as newly diagnosed diabetes. Hypertension was determined as systolic blood pressure $\geq$ 140 mmHg, diastolic blood pressure $\geq$ 90 mmHg. They also included pre-hypertension, which was defined as $\geq$120 mm Hg to < 140 mmHg systolic blood pressure or $\geq$80 mmHg to $\leq$ 90 mmHg diastolic blood pressure in non-hypertensive participants. The BMI was calculated as kg/m^2. In this study, researchers used WHO definition for overweight (BMI$\geq$ 25) and obesity (BMI $\geq$30). Also, they used the International Diabetes Federation (IDF) criteria for definition of central obesity (WC $\geq$ 80 cm in females and $\geq$ 94 cm in males). They found that among Iranians, the lowest prevalence of obesity and overweight were in 25-34 (n=1081) age group with 14.4 per cent of obesity and 31.8% of overweight. The highest prevalence was in 45-54 age groups with 29.3% of obesity and 39.8% of overweight. Females were more obese (30.6%) than males (14.2%). However, males were more overweight (37.5%). Also, urban participants were both more obese (23.8%) and overweight (38.2%) than rural residents (obesity-18.5%, OW-31.7%).

In the study by Nasser M. Al-Daghri et al (2013) the aim was to measure prevalence of metabolic syndrome among population of Saudi Arabia. Metabolic syndrome is a combination of several risk factors, such as central obesity, insulin resistance, dyslipidemia and hypertension. Authors also measured BMI of participants in order to investigate obesity/overweight as a risk factor. WHO definition was used for obesity and overweight, which has already been mentioned. The IDF (International Diabetes Foundation) criteria were used in order to determine the prevalence of metabolic syndrome. According to this criteria, central obesity as defined by ethnic and sex-specific waist circumference cutoff-points (males, 90 cm; females, 80 cm), plus two of the four other factors: raised triglycerides ≥ 150 mg/dL or 1.7 mmol/L), elevated BP (systolic BP ≥ 130 mmHg or diastolic BP ≥ 85 mmHg), raised fasting plasma glucose (≥5.6 mmol/L or ≥100 mg/dL) and low HDL cholesterol (<1.03 mmol/L or 40 mg/dL for males; or <1.29 mmol/L or 50 mg/dL for females) (Al-Daghri et al., 2013). Authors found that BMI of females with metabolic syndrome (31.1) was higher than without (28.3). The same trend was observed among males. BMI of males with syndrome (29.0) was higher than without (25.9). This study supported the idea that obesity/overweight can be a possible risk factor for development of metabolic syndrome.

In the study conducted by Bouguerra R. et al (2006) the aim was to report the prevalence of diabetes mellitus and impaired fasting glucose (IFG) among Tunisian population then compare their results with results from the previous study and to investigate possible relationships between diabetes and obesity (overweight), age, sex, residence. According to diabetes status, participants were divided into two groups: having known diabetes (if self reported) and having diabetes according to the ADA (American Diabetes Association) diagnostic criteria (if a fasting plasma glucose (FPG) ≥7 mmol/l). IFG (impaired fasting glucose) was defined as an FPG ≥6.1 mmol/l but <7 mmol/l (Bouguerra et al., 2006). All prevalence rates had been adjusted according to the area of residency (urban/rural). Also, authors measured BMI of participants. WHO definition was used for obesity and overweight, which has already been described. They found that in both years (1981 and 1996) average of BMI was higher among urban residents in both sexes. Also, women had a higher BMI in both years than men. For instance, in 1996 BMI (women) was 27.1 compared to BMI (men) 24.3. Overall, looking at time trends from 1981 to 1996 BMI increased among rural and urban residents in both sexes. The average BMI among urban women increased by 1.1units, while in urban men it increased by 0.7 units. Central obesity in 1996 was three times higher among urban women (60.8%) compared to men (26.0%).

In the study conducted by Hajat C. and colleagues (2012) the main aim was to report the prevalence of NCD among population of the United Arab Emirates (Abu Dhabi) and possible risk factors, such as obesity/overweight, smoking and physical activity. Researchers also measured prevalence of diabetes and gave the latest rates of mortality and morbidity. Moreover, they analysed the impact of NCD on economic, social and health systems of Abu Dhabi. All data for this study were taken from a National cardiovascular screening program Weqaya, which was developed in 2008. BMI of participants was measured and WHO definition was used for obesity/overweight. Authors found that obesity and overweight prevalence were higher in 50-59 age groups both among females and males (males: obesity-39%, OW- 78%); (females: obesity-64%, OW-85%). Overall, females were more obese compared to males. However, males were more overweight. Also, they measured physical inactivity prevalence

among urban and rural participants and found that urban residents had a higher level of inactivity. 60-60 age groups had the highest rate of physical inactivity (63%-urban males; 79%-urban females).

IV.   DISCUSSION

Factors, which could have impacted the increasing trend of obesity and overweight in Middle East

Results of review demonstrated that from 1945, when transition process has started in this region, prevalence of obesity and overweight has increased dramatically and now is becoming a complex public issue.

According to the Arab Center for Nutrition (2012), the first reason is the rapid change in lifestyle, which has been occurring during the last four decades, especially associated with low levels of physical activity (Musaiger, 2012). The systematic review showed that among Middle Eastern adults 20 years and above, physical inactivity ranges from 80% to almost 95% (Sharara et al., 2018). In Middle East, physical inactivity by using cars for transport and hiring maids for household work is associated with prosperity and high financial status. Another possible barrier is that daily exercises are not a habit for most of Middle East population, including not only women, but also men and children. Consequently, researchers recommend the idea of taking more steps.

The second possible factor can be dietary patterns, which have significantly changed in most Arab Middle East countries during the last 40 years, with increases in per capita fat and energy supplies from 1971 to 1997 (Table 1).

Table 1: Trends in daily per capita dietary energy and fat supplies in the Arab Middle Eastern Countries, 1971-1997

Country	Calories, Kcal			Fat, g		
	1971	1997	% increase	1971	1997	% increase
Egypt	2,351	3,287	39.8	47.1	57.6	22.3
Iraq	2,258	2,619	16.0	42.5	77.2	81.6
Jordan	2,436	3,014	23.7	58.5	86.2	47.4
Kuwait	2,637	3,096	17.4	71.4	94.7	32.6
Lebanon	2,356	3,277	39.1	62.9	107.8	71.4
Lybya	2,457	3,289	33.9	74.1	106.1	43.2
Saudi Arabia	1,876	2,783	48.3	32.3	78.6	143.3
Sudan	2,180	2,395	10.0	66.3	75.3	13.6
Syria	2,342	3,351	43.0	61.9	92.9	50.1
Tunisia	2,279	3,283	44.0	56.8	92.9	63.6
Yemen	1,779	2,051	15.3	30.2	36.5	20.8
UAE	3,093	3,39	9.6	85.6	109	27.3

Source: Musaiger, 2002.

Trends in daily per capita dietary energy and fat supplies in the Arab Middle Eastern Countries (1971-1997).

For example, increase trend in calorie supplies ranges from 9.6% in the UAE to 48.3% in Saudi Arabia. In fat supplies, increase trend ranges from 13.6% in Sudan to 143.3% in Saudi Arabia (Abdul-Rahim, et al., 2003). Today, vegetables, fruit and brown bread intakes are significantly decreasing in Middle East. As a result, intake of dietary

fiber has become very low. Study about nutrition situation in Gulf countries (Naja et al., 2017) demonstrated that almost 75-80% of Arabic population prefer salty taste and around 70% like a sweet taste. These specific preferences have led to add more salt, sugar to their food and have a great impact on next generation, because children grow up being used to salty and sweet food. For example, number of children at aged 12-17 years with high cholesterol is increasing and around 14% of them had a high blood pressure (Gies, 2017).

Our review showed that urban population is more obese than rural. It can be clearly observed in studies, which were conducted in Trabzon city in Turkey during different time periods (Erem, 2015). This study showed that from 1995 until 2012, total prevalence of obesity significantly increased from 19.2% to 34.4%. It demonstrated that rapid urbanization process and increasing domestic production and oil boom import had an indelible nutritional impact on economic growth of Middle East. As nutrition transitions appeared, population's diets tend to include more salt, sugar, junk food, and increased level of carbohydrates, and lifestyles become increasingly sedentary. Also, the highest prevalence of obesity/overweight was observed in 31-59 age groups followed by <30 and then the levels were decreasing. Possible reason for it can be that >60 people might be suffering from other ailments and obesity related illnesses, on medications which could be leading to lower levels of obesity.

Another sociocultural factor may be related to a high physical inactivity and may affect excess weight gain (Rahim, 2014; Martiradonna, 2014). It is clear, that in Middle East there are a lot of cultural and social barriers. It is especially a public issue for women, because men and women are not culturally allowed to mingle together. Only rich women are allowed to go to specific women's gym classes so other women do not have opportunity to increase their physical activity. Another putative risk factor for obesity among Arab Muslim women is an extremely hot weather in addition to high dietary food intake.

Moreover, in most of Middle East countries, being obese for women is a symbol of fertility, beauty, prosperity and high social status (Peltzer, Pengpid, 2015). In addition, Arab male population, especially older than 40, think that Western women, who are too slim and they prefer women who are overweight. The result of this belief has led to the Arabic women to be overweight before they get married. Moreover, their weight continued to increase after pregnancy and childbirth. Multiple pregnancies are a normal cultural feature of Middle East. At the same time, multiple pregnancies can be one of the contributors to obesity. In addition, education level among women in Middle East is not so high compared to Western society, so women in this region believe that if they eat more, it is good for their newborn (Zeng et al., 2014). As a result, they do not care about their weight during pregnancies.

Possible solutions for reducing obesity in Middle East

Most of researchers support idea that Middle East should find their own solutions for this public issue, due to the cultural aspects. Kanter R. believes (Kanter, Caballero, 2012) that there are a lot of different social and cultural barriers in this region and all of them need to be considered when trying to find solutions. For instance, shopping malls are being used as a way for walking among people with diabetes and heart disease. Another idea is promoting gym classes separately for women and men. For example, in Bahrain there are several outdoor parks, which on certain days are available only for women and families, but on other days it is mixed.

However, it is commonly believed that governments in the Middle East do not have a policy or plan of action in order to reduce prevalence of obesity/overweight and NCD among population. Observers suggest that the ministers of health in Arab countries are not well versed in the nutritional knowledge. Moreover, they could appear more interested in quick results from treatment than the long haul of prevention (Moonesar, Lewis, 40). Research also suggests that the Arab countries use books from Western countries in their education system. These educational materials do not have information about habits and cultural features of the Middle East. Consequently, the food pyramid of the USA was deemed not relevant for Arabic countries. Therefore, Arab Center for Nutrition has developed and published a food dome for Arab countries, which includes all necessary dietary patterns (Figure 2), with local vegetables and fruits.
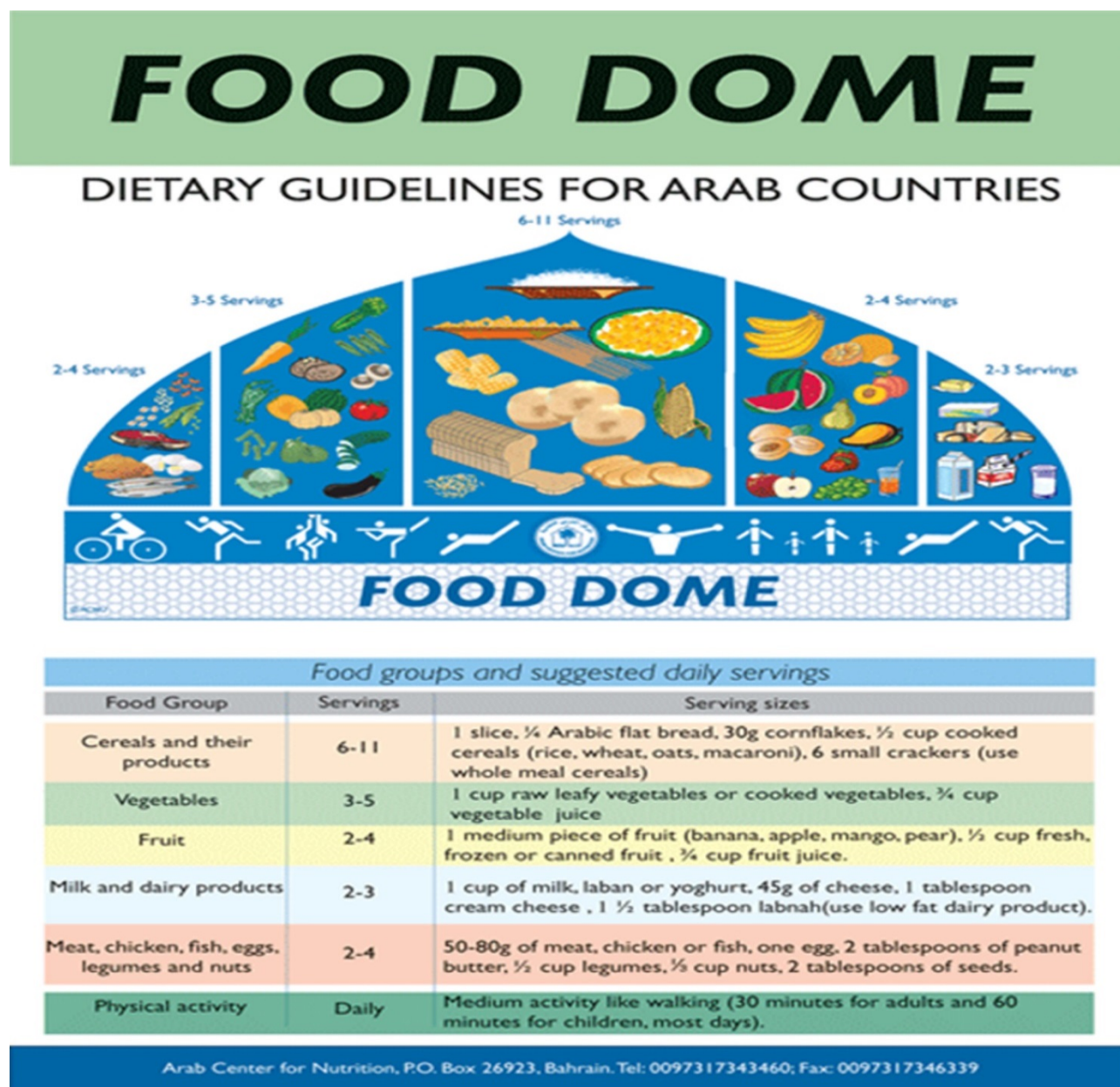

Figure 2: Food Dome for Arab countries

Source: Montagnese et al., 2019.

Nutrition center hopes that food dome will be used by doctors and nutritionists.

V. CONCLUSION

This review found that overall, prevalence of obesity and overweight has increased from 1980 among both sexes and age groups in the Middle East. Some countries however found that prevalence of obesity and overweight significantly decreased among females from 1991. 31-59 year old had the highest level of obesity and overweight in all studies, which were included in final analysis. Also, this review showed that urban population is more obese and overweight than rural residents. This review also shows that obesity and overweight can be potential a risk factor for developing of NCD.

Possible factors which may have impacted on increasing trend in obesity and overweight are changing nutritional trends with high energy consumption and decreased levels of physical activity, enhanced by social and cultural restrictions.

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