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Brief Report

Total Dietary Fiber Content of Selected Traditional Beverages in Egypt: A Brief Profile

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Abstract: Escalating obesity rates have become a major public health concern in North Africa and the Middle East. Culturally-congruent dietary health education and strategies continue to be warranted to address this increasing public health crisis. Knowledge and familiarity with traditional foods and their nutritive value would assist public health practitioners in becoming culturally competent when educating on healthy eating patterns. The aim of this study is to provide a brief dietary profile of the total dietary fiber (TDF) contents of selected traditional beverages in Egypt. Five cookbooks for Egyptian food recipes were reviewed for traditional beverages. Beverage recipes (n = 19) were selected and reviewed for their TDF content using the United States Department of Agriculture (USDA) National Nutrient Database for Standard Reference (Release 27). The published values for TDF content were tabulated and reported per 100 mL of consumable portions. The highest TDF content was found in carob juice (8.0 g) and the lowest found in peppermint tea (0.0 g) with an overall TDF mean content of 2.8 g. Traditional beverages could be regarded as important sources of TDF within a healthy Egyptian dietary pattern. Cultural awareness and familiarities to traditional foods and their respective dietary profiles should be encouraged as an objective towards building culturally-competent health professionals and combating obesity in Egypt. Furthermore, developments of a traditional Egyptian food nutrient database for public access should be explored.

Keywords: beverages; fruit juices; total dietary fiber; Egypt; obesity

1. Introduction

Global obesity continues to be the most severe wide-reaching epidemic that continues to create on-going public health challenges, particularly in developing countries [1]. With over one billion adults classified as obese (Body Mass Index (BMI) 30–39.9) and approximately 300 million as clinically obese (BMI ≥ 40) based on figures from the World Health Organization (WHO) [2], culturally-tailored dietary and health-promoting strategies and interventions continue to be warranted in these countries. In countries of the Middle East and North Africa (MENA), the prevalence of obesity has significantly increased over the last three decades with subsequent increases in obesity-related co-morbidities [1,3–6].

The Middle East region has the second highest mean BMI after North America and the second highest mean waist-to-hip ratio after South America [5]. According to WHO Regional Office for the Eastern Mediterranean, the prevalence of overweight and obesity in the MENA ranges from 74% to 86% in women and 69% to 77% in men [7]. In Egypt, there exists a high prevalence of obesity despite the country's level of economic development with a current observed overweight/obesity prevalence of nearly 70% [8–10]. Escalating levels of overweight and obesity among children and adolescents has been reported in Egypt affecting nearly 15% of 10–14 years old children [11].

A regional dietary shift has been observed across the MENA [12]. This shift has been characterized by an increase in consumption of fat and added sugars followed by a decrease in intakes of unrefined whole grains, beans, fruits, and vegetables [12]. Studies [13–16] continue to indicate an unfavorable dietary trend towards a Westernized-style diet in the MENA. In Egypt, the traditional diet has eroded towards excessive consumption of convenience foods and other unhealthy dietary patterns [17].

The traditional Egyptian diet, comparable to other traditional diets of countries bordering the Eastern Mediterranean basin and North Africa, has been historically characterized as a Mediterranean-style diet that incorporates a significant emphasis on unrefined whole grain breads, couscous, beans, dried nuts and seeds, fruits, and vegetables [18]. All of which can be regarded as significant sources of total dietary fiber (TDF). TDF is the indigestible portion of plant-based foods comprised of soluble and insoluble fiber [19]. The protective effects of TDF against obesity and weight gain continue been well documented [19–23] and has been attributed to several key factors, including a prolonged gastric emptying resulting in greater satiety, calorie displacement, and decreased absorption of macronutrients [23]. Fruit juices are regarded as a contributor to total fruit intake; however, commercially-made fruit juices often contain little to no fiber compared to whole fruits [24]. In Egypt, affordable freshly-made beverages such as fruit juices are often served by roadside vendors and fruit juice bars that are abundant in major cities and can serve as potential sources for TDF in the traditional Egyptian diet. A dietary assessment of traditional Egyptian beverages is necessary to assess their TDF content and overall nutritive value.

While previous studies [25–28] have attempted to offer TDF content profiles of selected traditional foods of the MENA, to date no study has attempted to offer a TDF profile for traditional beverages in Egypt. Additionally, with an ever-growing need to develop and build a culturally-competent public health workforce operating in various regions of the world to combat global obesity dietitians, health educators, and public health practitioners are expected to become fluent in dietary habits and foods specific to respective cultures. Therefore, the purpose of this study is to provide health educators, public health dietitians, and practitioners a TDF content profile of selected traditional beverages in Egypt.

This brief study adds value to the current literature for several reasons. Firstly, there appear to be insufficient attempts in the current literature to provide an integrative profile of commonly-consumed traditional beverages in Egypt associated with the current dietary trend and transition with the prevalence of obesity in the MENA region. In addition, there are a growing number of studies that help explain the growing obesity problem facing this region. Finally, addressing dietary trends and traditional foods to help reduce obesity and obesity-related co-morbidities continues to be major public health topic on the world health agenda and a crucial factor in establishing dietary priorities and interventions. Consequently, this brief profile of Egyptian beverages is the first attempt to shed light into the dietary customs of nutritional value of traditional beverages in Egypt.

2. Materials and Methods

Five cookbooks for Egyptian food recipes were selected and reviewed for commonly consumed traditional beverages. Nineteen (n = 19) traditional Egyptian beverage recipes were selected and reviewed using the United States Department of Agriculture (USDA) National Nutrient Database for Standard Reference (Release 27) [29]. One sample for each type of beverage was considered in this brief profile. The published values for the TDF content and corresponding energy content of the beverages were reviewed and tabulated. Egyptian beverage recipes written in Arabic were translated to English. All values for the beverages were reported per 100 mL of consumable portions and TDF content per 1000 Calories (kcal). For beverage recipes that called for boiling ingredients, beverage samples were reported after boiling, adjustments for loss of moisture content and loss of nutrients were taken into account prior to nutrient profile calculation.

3. Results

Of the selected beverages, fourteen were fruit-based juices, four were herb, seed, or spice-based teas, and one was a milk-based beverage (see Table 1). The five highest values for TDF per 100 mL of consumable portions were carob juice (8.0 g), dried apricot juice (7.3 g), guava juice (5.4 g), tamarind juice (5.1 g), and pomegranate juice (4.0 g). The highest TDF content was found in carob juice (8.0 g) and the lowest TDF content was found in peppermint tea (0.0 g) with an overall TDF mean content of 2.8 g. Based on nutrient-calorie density, the five highest TDF content per 1000 kcal was caraway seed tea, lemonade juice, guava juice, carrot juice, and strawberry juice (see Table 1).

Table 1. Total Dietary Fiber (TDF) content of traditional Egyptian beverages (per 100 mL)

Prepared Beverages	**Chief Ingredients**	**Total Dietary Fiber (g/100 mL)**	**Energy (kcal/100 mL)***	**Total Dietary Fiber (g)/Energy (1000 kcal)**
Strawberry Juice	Strawberries, Lemon Juice, Sugar (optional)	2.0	33	60.6
Mango Juice	Mangoes, Water, Sugar (optional)	1.6	60	26.7
Tamarind Juice	Tamarind Pulp, Water, Sugar (optional)	5.1	239	21.3
Guava Juice (Milk optional)	Guava, Water, Sugar (optional)	5.4	68	79.4
Dried Apricot Juice	Dried Apricot, Water, Sugar (optional)	7.3	241	30.3
Watermelon Juice	Watermelon, Sugar (optional)	0.4	30	13.3
Cantaloupe Juice	Cantaloupe, Lemon Juice, Water, Sugar (optional)	1.1	36	30.6
Orange Juice	Oranges	2.2	49	44.9
Carrot Juice	Carrots, Water	2.8	41	68.3
Limeade Juice	Limes, Fresh Mint Leaves, Water, Sugar (optional)	1.7	30	56.7
Lemonade Juice	Lemons, Fresh Mint Leaves, Water, Sugar (optional)	2.8	29	96.6
Banana Juice (milk optional)	Bananas, Water, Sugar (optional)	2.6	89	29.2
Pomegranate Juice (with seeds)	Pomegranate Seeds, Lemon Juice, Water	4.0	83	48.2
Carob Juice	Carob Powder, Water, Sugar (optional)	8.0	222	36
Hibiscus Tea	Hibiscus Leaves, Water, Sugar (optional)	0.3	10	30
Peppermint Tea	Green Tea (or tea of choice), Fresh Mint Leaves, Water	0.0	1	0
Caraway Seed Tea	Whole Caraway Seeds, Water	2.5	22	113.6
Aniseed Tea	Whole Anise Seeds, Water	1.0	23	43.5
Coconut Rice Milk	Grated Coconut, Milk, Rice Starch, Sugar (optional), Vanilla	2.2	250	8.8

* Energy from required ingredients were only included. Energy from optional ingredients were excluded due to taste variation & optional use.

4. Discussion

There is a predominant focus on fruit-based beverages within the traditional Egyptian diet. Unlike commercially-made fruit juice beverages, the practice of mechanically blending fruits as seen in traditional Egyptian fruit beverages preserves an appreciable amount of the TDF of the fruit, thereby minimally compromising its nutritive value. For any given fruit, the amount of TDF in its juice differs with the processing technique [30]. A study [31] evaluating the availability of TDF of fruit juices found that juices prepared with a blender were likely to maintain more of their TDF than juices prepared with a presser or extractor.

Using the nutrient density approach, the Institute of Medicine National Academy of Sciences Dietary Reference Intakes (DRI) and the FDA Labels guide Daily Value (DV) recommends a fiber density consumption of 14 g/1000 kcal and 12 g/1000 kcal, respectively [32,33].

These intake recommendations are based on scientific evidence on the relationship between TDF intake and health outcomes in adults. In light of this, traditional Egyptian beverages possess sufficient fiber density that contributes to daily fiber intake after considering caloric density.

Studies [30,34,35] continue to support the beneficial effects of TDF specifically in traditional fruit juice beverages in enhancing perceived satiety, regulating energy intake, modulating gastric emptying, and reducing weight gain. Previous studies [36–42] have also supported the potential activity of some traditional Egyptian beverages as functional foods with antioxidative, antihypertensive, hypolipidemic, and anti-carcinogenic properties particularly in hibiscus tea, tamarind juice, dried apricot juice, and carob juice. In addition, the potential benefits of guava, strawberries, and pomegranate for the prevention of obesity and obesity-related diseases have been previously demonstrated [43–48].

5. Conclusions

With the accelerated erosion of the traditional Egyptian diet towards unhealthful dietary patterns, public health strategies are called for to address this growing shift in the face of Egypt's growing obesity prevalence and related co-morbidities. Traditional Egyptian beverages could provide an appreciable amount of TDF as part of an overall healthy dietary pattern among Egyptian populations. Additionally, in light of the optional use of sugar as an ingredient in homemade traditional Egyptian beverage recipes, low calorie sugar substitutes may be encouraged as an alternative to sugar in these recipes thereby minimizing caloric density and maximizing nutrient density. Furthermore, dietitians, health educators, and public health practitioners operating in Egypt and other regions of the world with significant Egyptian communities should familiarize themselves with commonly consumed traditional Egyptian beverages as part of any culturally congruent education on healthy dietary eating patterns. Health professionals who continue to immerse themselves with traditional beverages that are specific to certain cultural heritages would be able to provide effective culturally sensitive education and information as it relates to diet and health.

6. Limitations

There are some limitations to this study that should be noted. Although the author reviewed five Egyptian cookbooks for commonly-consumed traditional Egyptian beverages, relevant beverage recipes may have been missed. Additional cookbooks would likely have added additional beverage recipe samples. In addition, some traditional beverages were not included in this study, such as sugarcane juice, doum palm juice, and liquorice root juice due to an absence of a nutrient profile in the USDA nutrient database.

It is important to note that the reported calculations were limited to only traditional homemade beverages and beverage ingredients listed in the USDA nutrient database. Furthermore, the TDF values for these beverages were obtained only from the USDA nutrient database since no publically-accessible nutrient database for Egypt currently exists. With regards to the energy content of the beverage samples, only energy content from required ingredients were included for reporting purposes. Energy from optional ingredients were excluded due to taste variation and optional use as per the cookbook recipes. The author acknowledges that valuable and applicable data may have been excluded as a result of these limitations and delimitations.

Future studies are warranted to provide a more comprehensive dietary profile of these beverages to include total caloric potential, vitamins, minerals, total fatty acid profile, and other nutrients as well as non-nutrient phytochemicals for a more thorough nutritional assessment of traditional Egyptian beverages and their link to overall health. Furthermore, considerations toward generating and establishing a publically-accessible traditional Egyptian food nutrient database for educational and research purposes should be explored.

Conflicts of Interest

The author declare no conflict of interest.

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