Habitual Use of Medicinal Plants among a Group of Jordanian Elderly According to Physical Activity and Gender

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Abstract: *Introduction*: Traditional medicine use has grown significantly in the last few decades around the world. Similarly, in Jordan. The information regarding the percentages of older adults in Jordan who adopt a healthy life-style and consuming medicinal plants along with performing physical activity are limited.

Objective: To evaluates the use of medicinal plants among a sample of Jordanian elderly population and the effect of physical activity and gender on their habitual medicinal plants usage.

Method: A cross sectional study was conducted on 120 elderly Jordanian (62 women; 58 men) and evaluated for medicinal plant usage. A questionnaire was used for collecting personal, social, anthropometries and lifestyle information including the daily activities through a personal interview by the principal investigator.

Results: In this study about 90% of all participates were using medicinal plants and 95% of males and females used medicinal plants were physically active. Females were used medicinal plants (100%) more than male (79.31%), the most medicinal plants used among elderlies were sage (88.33%), thyme (85.00%) and peppermint (81.67%).

Conclusion: The study highlight the increasing number of herbal users among Jordanian elderlies especially females and physically active people and alarming about the possible risk associated with herbal/drug interactions among this age group.

Keywords: Medicinal plants, elderly, female, male, Jordanian.

1. INTRODUCTION

The use of medicinal plants in treating health problems has been practiced since ancient times and therefore being used in traditional medicine for several years. Nowadays, studies have shown that the use of medicinal plants are linked to the treatment and prevention of many chronic diseases [1]. The preventive effects of these plants are attributed to the presence of many phytochemicals with anti-oxidant activities. It has been shown that the oxidative stress is positively correlated with metabolic dysfunction and the development of several chronic diseases [1-4]. Oxidative stress can also be produced in response to physical activity, however, prolonged physical activity can provide an adaptation to the oxidative stress and improved physiological responses and health. However, as a person ages, the impaired musculoskeletal systems associated with aging can decrease the levels of the physical activity leading to a sedentary life-style [5]. The sedentary life-style in older adults has been shown to increase the body weight, and this increase is not due to the increase in energy intake, but due to the decrease in energy expenditure [6]. A reduction in physical activity and a sedentary life-style can lead to obesity. Obesity has been linked to a number of chronic diseases, such as diabetes and cancer [7-10], and therefore, treatment of obesity was one of the primary goals for the treatment of these diseases [11]. There are several practices that are used for the treatment of obesity, one of these include the use of medicinal plants [12-15]. Treatment based on the use of medicinal plants considered one of the best non-conventional and non- invasive methods for treating obesity compared to the conventional medicinal treatments, which are usually associated with undesirable side effects. Medicinal plants can contribute to weight loss through several mechanisms

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including the suppression of appetite and induction of satiety, increase metabolism, inhibition of enzymes involved in digestion, and delaying or inhibiting absorption of nutrients [16].

Consuming medicinal plants for treating certain health conditions is not restricted to certain educational and income levels. However, it has been found that consuming medicinal plants was linked to the high educational and income levels [17, 18].

There are huge number of medicinal plants that lack the scientific evidence for their use as an alternative medicine, but traditionally used to treat many age-related chronic diseases that are also associated with obesity. In addition, herbal medicinal plants were used for their ability to treat or relief the symptoms of many health-related problems, such as constipation, diarrhea, kidney and respiratory problems [19], all of which can appear with compromised immune system that can be observed in elderly people.

In Jordan, there is number of older adults that incorporate medicinal plants in their usual diet either as a part of their meal or as a beverage. The use of medicinal plants along with adopting an active life-style though increasing physical activity considered important for the prevention of age-related chronic diseases. However, the information regarding the percentages of older adults in Jordan who adopt a healthy life-style and consuming medicinal plants along with performing physical activity are limited. Therefore, this is a cross-sectional study that evaluates the use of medicinal plants among a sample of Jordanian elderly population and the effect of physical activity and gender on their habitual medicinal plants usage.

2. METHODOLOGY

2.1. Study Population and Design

Across sectional observational study was conducted on 120 elderly Jordanian people who live in Amman (62 women; 58 men) and evaluate the medicinal plant usage among them after they signed a consent form. The study participants were divided into two groups; the first group consisted of 40 elderlies who attended the gym at least twice a week for the last 2 years, and the second group consisted of 80 elderlies who were home resident or physically inactive. The participants whom aged < 65 years or those with acute illness and bedridden patients were excluded from the study. A structured valid and reliable questionnaire was used for collecting the personal, social, medical and lifestyle information including the daily activities and the anthropometric measurements through a personal interview by the principal investigator. The medicinal plant usage were evaluate by asking directly about the plants using the local name and a clear picture of each medicinal plants. The investigator evaluated participant's usage and knowledge about the medicinal plants namely: Sage, Rosemary, Cinnamon, Cardamom, Peppermint, Chamomile, Ginger, Thyme, Anise, Clove and Silver nailroot. The indications of use were also evaluated (Colic, Sleep aid, Constipation, Diabetes, Dental health, Respiratory and other indications).

2.2. Anthropometric Measurements

Height was measured using same stadiometer for all participants. For accurate measurements, study participants were barefooted with minimal clothing to facilitate correct position, and having their heels together, arms to the side, legs straight, shoulders relaxed and the head in the Frankfort horizontal plane. The measurement was recorded to the nearest 0.5 cm [19].

Weight was measured using the same beam scale (Seca 700 physicians beam scale). The scale was calibrated and checked for zero-balance each measurement. Participants were asked to stand unassisted on the center of the scale, with minimum clothing and without shoes and looked straight ahead. The measurement was recorded to the nearest 0.1 kg [19].

Body mass index (BMI)

Body mass index was calculated according to Quetelet's formula [19]:

$$BMI = \text{weight (kg)} / \text{height (m)}^2$$

2.3. Ethical Approval

This study was conducted according to the Declaration of Helsinki (2008, including 2013 amendments) [21] and written informed consent was obtained from all participants.

2.4. Data Analysis

Collected data from the cross-sectional study was entered twice in data sheets, checked and analyzed. Subjects were classified into two variables according to physical activity and gender. Descriptive statistics were performed using frequency as well as means and

standard deviation to describe the categorical and numerical data, respectively. Chi square test was used to compare the categorical variables and Fisher exact test was used when one of the cells is less than 5. Analysis was made by graph pad prism 5 software (San Diego, CA) and P-value $\leq$ 0.05 was considered as significant.

3. RESULTS

A total of 120 elderly people participated in this survey, (58 males, and 62 females) with a mean age 71 years for males and 68 years old for females. About 63% of physically active participants were attained collage for 2-4 years whereas 45% of physically in active participants complete their educations after secondary school.

The frequency of obesity and medicinal plants use according to gender and physical activity are shown in Table **1**. Among study sample 34.48% of males were obese; whereas more than fifty of females were obese (54.84%). All females participated in this study used medicinal plants, and 95% of males and females used medicinal plants were physically active. In the total, about 90% of all participates were using medicinal plants.

The frequency of medicinal plants used among elderlies is shown in Table **2**. The most medicinal plants used among elderlies (males and females) in this study were sage (106 (88.33%)), thyme (102 (85.00%)), and peppermint (98 (81.67%)), whereas, the lowest one was rosemary (16 (13.33%)). There were a significant differences between elderly males and elderly females in using rosemary (2 (3.45%),14 (22.58%), respectively), cinnamon (28 (48.28%), 50 (80.65%), respectively), cardamom (30 (51.72%), 58 (93.55%), respectively), and ginger (18 (31.03%, 58 (93.55%), respectively) medicinal plants; females used them more than males. On the other hand, there were

Table 1: The Frequency of Obesity and Medicinal Plants Use According to Gender and Physical Activity[1-2]

Variables	Obesity (BMI ≥ 30)[1]	Medicinal plants use[2]
	N (%)	N (%)
Male (N=58)	20 (34.48)	46 (79.31)
Female (N=62)	34 (54.84)	62 (100.0)
Physically active	10 (25.0)	38 (95.0)
Physically inactive	44 (55.0)	70 (78.5)
Totals (N=120)	54 (45.00%)	108 (90.0)

[1]The obesity was significantly (p< 0.05) different according to physical activity.
[2]The medicinal plants use was significantly (p< 0.05) different according to gender.

Table 2: The Frequency of Medicinal Plants Use among Elderlies According to Gender[1-2]

Medicinal plants[1]	Male (N=58)	Female (N=62)	Totals (N=120)	P-Value
	N (%)	N (%)	N (%)	
Sage, *Salvia triloba*	48 (82.76)	58 (93.55)	106 (88.33)	0.320
Rosemary, *Rosmarinus officinalis*	2 (3.45)	14 (22.58)	16 (13.33)	0.037*
Cinnamon, *Cinnamomum ceylanicum*	28 (48.28)	50 (80.65)	78 (65.00)	0.013*
Cardamom, *Elettaria cardamomum*	30 (51.72)	58 (93.55)	88 (73.33)	0.000*
Peppermint, *Mentha piperita*	44 (75.86)	54 (87.10)	98 (81.67)	0.383
Chamomile, *Matricaria aurea*	34 (58.62)	46 (74.19)	80 (66.67)	0.269
Ginger, *Zingiber officinalis*	18 (31.03)	58 (93.55)	64 (53.33)	0.001*
Thyme, *Thymus vulgaris*	44 (75.86)	50 (80.65)	102 (85.00)	0.093
Anise, *Pimpinella anisum*	40 (68.97)	46 (74.19)	90 (75.00)	0.406
Clove, *Syzygium aromaticum*	16 (27.59)	16 (25.81)	62 (51.67)	0.061
Silver nailroot, *Paronychia argentea*	4 (6.90)	4 (6.45)	8 (6.67)	0.916

[1]Medicinal plants are given as common, *scientific names*.
[2]*The Chi-square statistic is significant at the .05 level according to gender.

Table 3: The Frequency of Medicinal Plants Use among Elderlies According to Physical Activity[1-2]

Medicinal plants	Physically active (N=40)	Physically inactive (N=80)	P-Value
	N (%)	N (%)	
Sage, *Salvia triloba*	38 (95.0)	68 (85.0)	0.075
Rosemary, *Rosmarinus officinalis*	14 (35.0)	2 (2.5)	0.000*
Cinnamon, *Cinnamomum ceylanicum*	32 (80.0)	46 (57.5)	0.043*
Cardamom, *Elettaria cardamomum*	32 (80.0)	56 (70.0)	0.241
Peppermint, *Mentha piperita*	38 (95.0)	60 (75.0)	0.017*
Chamomile, *Matricaria aurea*	26 (65.0)	54 (67.50)	0.944
Ginger, *Zingiber officinalis*	28 (70.0)	36 (45.0)	0.039*
Thyme, *Thymus vulgaris*	36 (90.0)	66 (82.5)	0.200
Anise, *Pimpinella anisum*	34 (85.0)	56 (70.0)	0.100
Clove, *Syzygium aromaticum*	24 (60.0)	38 (47.5)	0.260
Silver nailroot, *Paronychia argentea*	2 (5.0)	6 (7.5)	0.749

[1]Medicinal plants are given as common, *scientific names*.
[2*]The Chi-square statistic is significant at the .05 level according to physical activity.

no significant differences in the frequency of used the other medicinal plants among elderly males and elderly females (sage (48 (82.76%), 58 (93.55%), respectively), peppermint (44 (75.86%), 54 (87.10%), respectively), chamomile (34 (58.62%), 46 (74.19%), respectively), thyme (44 (75.86%), 50 (80.65%), respectively), anise (40 (68.97%), 46 (74.19%), respectively), cloves (16 (27.59%), 16 (25.81%), respectively), and silver nailroot (4 (6.90%), 4 (6.45%), respectively).

The frequency of medicinal plants used among elderlies according to physical activity is shown in Table **3**. There were a significant differences in the frequency of rosemary, cinnamon, peppermint, and ginger that used among physically active (35.0%, 80.0%, 95.0%, and 70.0%, respectively) and physically inactive elderlies (2.5%, 57.5%, 75.0%, and 45.0%, respectively). There were no significant differences in the frequency of sage, cardamom, chamomile, thyme, anise, clove, and silver nailroot that used among physically active elderlies (95.0%, 80.0%, 65.0%, 90.0%, 85.0%, 60.0%, and 5.0%, respectively) and physically inactive elderlies (85.0%, 70.0%, 67.5%, 82.5%, 70.0%, 47.5%, and 7.5%, respectively). In general, according to this study the frequency of using medicinal plants among physically active elderlies more than physically inactive elderlies.

The frequency for each medicinal plants indications of using among Jordanian elderlies as shown in Table **4** indicated that the sage and peppermint were used mainly for colic (42 (39.6%), 23 (23.5%), respectively), rosemary was used for dental health (6 (37.5%)), and cinnamon and ginger for diabetic patients (29 (37.2%), 17 (26.6%), respectively). Cardamom was used for colic (19 (21.6%)), dental health (18 (20.5%)), and other indications (13 (14.8%)) such as headache, weight reducing and others. On the other hand, chamomile was used mainly for colic (20 (25.0%)) and respiratory health (19 (23.7%)), thyme was used mainly for respiratory health (45 (44.1%)), anise for insomnia (29(32.2%)), and clove for dental health (40 (64.5%)). Silver nailroot was the least frequency used among Jordanian elderlies was used mainly for diabetic patients (5 (62.5%)).

4. DISCUSSION

4.1. Age and Traditional Plants

Traditional medicine use has grown significantly in the last few decades around the world. Similarly, in Jordan, a study revealed that about 60% of the population uses traditional medicine because they believe in the ability of those plants in reducing pain and healing power [22]. “Herbal products, for the purpose of this paper, are defined as plant parts or extracts of plant parts” that are used in traditional boiling or soaking methods rather than extracts commonly used as prescription or over the counter drugs [23].

Several authors reported that older adults tend to use complementary and alternative medicine (CAM), specifically traditional plants, and more than younger adults [24]. This was in agreement with our study findings which reported that 90% of elderly people use

Table 4: The Frequency for each Medicinal Plants Indications of Use among Jordanian Elderlies[1]

Medicinal plants (common names)	N	Indications of use N(%)						
		Colic	Insomnia	Constipation	Diabetes	Dental health	Respiratory problems	Other indications*
Sage	106	42 (39.6)	3(2.8)	0(0.0)	13 (12.3)	8 (7.5)	4 (3.8)	36 (34.0)
Rosemary	16	2 (12.5)	0(0.0)	0 (0.0)	3 (18.8)	6 (37.5)	0 (0.0)	5 (31.3)
Cinnamon	78	16 (20.5)	3(3.8)	4 (5.1)	29 (37.2)	3 (3.8)	5 (6.4)	18 (23.1)
Cardamom	88	19 (21.6)	7(7.9)	9 (10.2)	10 (11.4)	18 (20.5)	12 (13.6)	13 (14.8)
Peppermint	98	23 (23.5)	17(17.3)	15 (15.3)	0 (0.0)	6 (6.1)	16 (16.3)	20 (20.4)
Chamomile	80	20 (25.0)	16(20.0)	5 (6.3)	10 (12.5)	6 (7.5)	19 (23.7)	4 (5.0)
Ginger	64	2 (3.1)	3(4.7)	7 (10.3)	17 (26.6)	10 (15.6)	14 (21.9)	11 (17.2)
Thyme	102	5 (4.9)	8 (7.8)	4 (3.9)	8 (7.8)	17 (16.7)	45 (44.1)	15 (14.7)
Anise	90	16 (17.8)	29(32.2)	12 (13.3)	0 (0.0)	2 (2.2)	21 (23.3)	10 (11.1)
Clove	62	0 (0.0)	0 (0.0)	0 (0.0)	6 (9.7)	40 (64.5)	0 (0.0)	16 (25.8)
Silver nailroot	8	1 (12.5)	0 (0.0)	0 (0.0)	5 (62.5)	0 (0.0)	0 (0.0)	2 (25.0)

[1]*other indications including: Headache, weight reducing, reproductive, treatment of chronic diseases.

traditional plants regularly. Our results are consistent with the prevalence rates demonstrated in other studies reported that people 65 years old and older are the largest age group using traditional therapies and CAM [25]. In a cross-sectional study, Zeilmann *et al*. reported that most of the patients who used herbal supplements were 65-74 years old [26]. Another study in 2001 found that women, over the age of 75 years, living alone and have financial problems were the main users of the herbal supplements [27].

4.2. Gender and Traditional Plants

The results reported in our study confirmed the well-established findings in the literature. In our study, we found that women are more likely to use CAM, such as herbs [28], which agrees with the findings of Raji *et al.* who also found that elderly females tend to use herbs more often than males [29]. Adams *et al*. pointed in his article that women who suffer illness or pain uses herbs more frequently than those who have a better health [25]. On the other hand, Wazaify *et al*. reported a significant difference in the use of CAM between genders, specifically, 59.6% of CAM users were females [24].

It was suggested that the reason behind this gender- herbs correlation might be due to the likelihood of women to be more tangled with health care practices and strategies more than men [28]. However, our results did not agree with those of Ali-Shtayeh who did not find a difference between females and males, but he found a significant difference in the use of CAM between city dwellers and village or refugee camp residents [30].

4.3. Use of Traditional Plants in Physically Active People

Our findings indicate that 95% of the study sample who were physically active tend to use more medicinal plants compared to those who were physically inactive (78.5%). Similar results were observed in Palestine, where 35% of people using traditional medicine are exercising frequently.

In Jordan, herbs are available in the market and sold in almost every store for many reasons. Few people in Jordan believe in the hypothesis that herbs may improve physical performance or muscle recovery. In addition, Jordanian people tend to use herbs frequently for reasons other than enhancing the performance of physical activity. For example, ginseng, ephedrine and Chinese mahauang which are commonly used worldwide for their suggested importance in improving exercise performance are not widely known and used by Jordanians. However, physically active people who usually involve in gym and sports are well educated people with decent income.

Many authors and researcher have linked educational level and income with the use of traditional plants and therapy, which make our findings convincing. In our study we found that physically active people were well-educated and with good economic levels. Our results agree with those of Bishop *et al.* and Wazaify *et al.* who reported that CAM use is more

common in well-educated persons and in people with a good economical level [18, 24].

Higher education level was significantly associated with CAM uses in many countries, including USA, Canada and Australia.

4.4. Implications of Use

In our study, we evaluated the consumption of two types of herbal plants; the widely used plants with highly recognized benefits including sage, cinnamon, cardamom, peppermint, chamomile, thyme and anise, and the less common plants including rosemary, silver nail root and clove.

Many of the study participants reported that they mainly use traditional plants because they believe they help in reducing symptoms of many diseases and health problems. Examples are gastrointestinal illness, sleeping disorders, constipation, diabetes, dental pain and respiratory tract problems. This was very similar to the conclusion of Gyllenhall *et al*. who reported that 27% of the people used CAM therapies for fatigue, 26.4% for insomnia [23]. Ali-Shtayeh also demonstrated that most of his study population (62.1%) used CAM because they believe they have a treatment modality with potential efficacy and few adverse effects [30].

Wazaify *et al*. also revealed that 16.6% of the diabetic participants reported the use of CAM. Sixty-nine % of the participants believes that CAM may relieve symptoms of diseases, 18% think they may cure and 18%beleive they slow down the progression of the disease [24].

In conclusion, this research confirms the increasing number of herbal users among Jordanian population especially females and physically active people. However, more research are needed which may take a larger number of subjects. Adverse effect of herbs and herbs-drug interaction is a significant point that worth focusing.

CONFLICT OF INTEREST STATEMENT

The authors have no conflicts of interest related to this work.

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