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Impact of a Detox Diet paradigm in Weight Management

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Abstract

Research Question: The main Research Question concerns the attitudes of the respondents about the "detox" diet. The term detoxification as a concept is not considered as new but its application has known a drift starting from religious point of view in terms of purification and redemption to therapeutically characteristic in treating alcohol or drug addiction until its new relevance in treating obesity and reducing fat. This new paradigm has been used in health and wellness centres by dieticians and practitioners to overcome the failure of traditional diet programs.

Purpose: The purpose of the study is to define, present and qualify the "detox" concept or paradigm and to investigate the attitudes of the respondents towards the "detox" concept as a diet method.

Method: Participants in the study are divided into two groups; the group that already used "detox" and the group that have not yet used "detox" diet. The two groups are asked the same questions which are designed to measure their attitudes regarding "detox" diet. For this purpose, a quantitative analysis is conducted using descriptive statistical non-parametric method Chi-Square.

Results: There is no significant difference of attitudes toward a detox diet between the users and non-users of it ($p > 0.05$).

The results of the study show that detox diet is not something appealing for the ones who went through it although they admit that it is an effective method to lose weight and get healthy. The same approach sounds to be seductive for the patients who didn't try it before in order to get healthy without specifying the right time to follow such diet.

Organization: The results of the study emphasises the need of organizations who provide "detox" diet, to present it to the potential customers and to point out its positive effects on the health of the people, who use it.

Society: Study results emphasise the social responsibility of the providers of "detox" and the administrative authorities, to motivate and support the research on the "detox" diet, and its positive and negative effects on the health of the population. The stakeholder in a society, who take care of the health of the population, should rise the question of physical fitness and the healthy life style of the people.

Originality: The main value of this research study is to address the meaning of the healthy life style of the people and the means like "detox" diet to exercise it.

Limitations: The patients who were investigated in the study are all adults and considered as healthy with no remarkable illness. Yet, the participants of the group that has experienced detoxification cooperated in a diet voluntarily or upon the recommendation of the dietitian.

Further research: To overcome the debate between positive support and side effects claims, there should be tangible indicators like testing methods in the process of determining the main markers of intoxication and their relation with stubborn fat as well as the connection between the concentration of toxins decline in the blood and the level of metabolism and percentage of fat to prevail over the approach limitations. Measuring the toxins concentration and comparing them before and after detox diets adjust the research from being assuming to scientifically proven one.

Further research should address the relation between the healthy life style and the need to use the models like "detox" diet to achieve it.

Keywords: paradigm, health, life-style, body weight, detox diet, detoxification.

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1 Introduction

Change is a constant and inescapable part of life. As Humans we are all capable of and subject to change (Keith, 2016). This continuous desire is applied in the search for a new movement whether in fashion, technology, design and even when it comes to food and diet methods. In this context, people tend to have an urgent need to reach their target in a fast way regardless of any possible side effect. For instance it was found that The American psyche is focused on quick results in many areas, including weight loss programs (Weintraub, 1992).

People follow what is trendy and overspread. Although traditional diet school therapies have always been reliable with good effect, but the urge need for new treatments sounds like tempting to try.

Detox in Nutrition has always been in religious practices and through traditional customs and cultures long before; nowadays the concept of cleansing and rejuvenating the body system is gaining attractiveness and spreading through press, social media, magazines, books and celebrities 'stories. The main question to tackle is about the effectiveness and the side effects of detoxification in terms of reducing weight while improving health being.

1.1 Detox History

Detoxification is an ancient process of purification and cleansing that dates back as far as the Roman, Greek, Native American and Indian Cultures. Traditional herbal medicine for example is cross cultural; it was and has been a ritual in many societies. Many effective techniques are still used to rid the body of toxins such as saunas, fasting, rebounding, dry brush, herbs, rest, water, meditation, exercise and a variety of body work (Carty, 2015). The concept behind these cleanses is as old as human history. "There's a straight line from detox diets to classical religious fasting," says Harvey Cox, professor of divinity at Harvard University (Springen, 2008). Saint Augustine once said "fasting cleanses the soul and raises the mind" (Burris, 2016). In many religions, fasting is associated with enlightenment and atonement and understanding the suffering of the poor. "It's a way of resetting one's moral clock, of starting with a clean slate," says Michael McCullough, a psychology professor at the University of Miami. Christians fast during Lent, Muslims fast during Ramadan and Jews fast on Yom Kippur, the Day of Atonement that follows the New Year. "Fasting builds self-control," says McCullough. "It allows people to build strength for when they have to adhere to some other moral dimension of their religion." (Springen, 2008)

The seductive power of detox diets presumably lies in their promise of purification and redemption, which are ideals and deep-rooted inhuman psychology (A. Klein & Kiat, 2015).

1.2 Detox types

Detox diets range from total starvation fasts to juice fasts to food modification approaches and often involve the use of laxatives, diuretics, vitamins, minerals and/or 'cleansing foods' (Allen, Montalto, Lovejoy, & Weber, 2011).

Catherine Collins, an NHS dietitian at St George's Hospital says. "The ultimate lifestyle 'detox' is not smoking, exercising and enjoying a healthy balanced diet like the Mediterranean diet which is adorned with meats, fish, olive oil, cheeses, salads, wholegrain cereals, nuts and fruits."

1.3 Purpose and goal of the research

The aim of this Research is to weigh and compare between the negative effect of detoxification and the supporting ideas and thoughts where the studies are founded on chemicals and pollution effects on health. The study further assists in evaluating objectively on the effectiveness of detox therapies in terms of weight management and opens new windows on future investigation to have more accurate answers and proofs on detoxification.

2 Literature review

2.1 Detox side effects

2.1.1 Detox criticism

The detox term and concept has been criticized by many scientists pointing on its side effect and its poor evidence of cleaning the body and eliminating "toxins". For instance The British Dietetic Association described it as "a popular nonsense buzzword in the health and beauty world" and as a "marketing myth rather than nutritional reality" (Porter, 2016).

Currently, no scientific studies have investigated the effectiveness of commercial detox diets for losing weight (A. Klein & Kiat, 2015).

Some claim that the idea of flushing your system of impurities and leave your organs squeaky clean and raring to go is a scam. It's rather a pseudo-medical concept designed to sell you things (Porter, 2016). Edzard Ernst, emeritus professor of complementary medicine at Exeter University classify detox as two types, one is respectable and the other isn't. The respectable one, he says, is the medical treatment of people with life-threatening drug addictions. The other is "the word being hijacked by entrepreneurs, quacks and charlatans to sell a bogus treatment that allegedly detoxifies your body of toxins you're supposed to have accumulated." (Mohammadi, 2014).

Till now, there is a lack of regulation in the detox diet industry; the EU has refused to authorize the detoxification claims of a dozen nutritional substances (Sante, 2013).

2.1.2 Weight loss disadvantage

The body is a well-developed system that has its own built-in mechanisms to detoxify and remove waste and toxins through numerous organs, such as the skin, gut, liver and kidneys (A. Klein & Kiat, 2015).

Foreign chemicals that are not easily removed by these processes include Persistent organic pollutants (POPs) and some metals (Sears, 2012). POPs are industrial chemicals banned in

EU and the USA since 1970s, accumulate in human adipose tissue. POPs have been used in flame retardants, pesticides and paints, as well as in coolants and lubricants in electrical equipment (Jones & De Voogt, 1999).

A scientific theory has been released in the 1980s when the Environmental Protection Agency (EPA) conducted a program called the National Human Adipose Tissue Survey (NHATS). In this research it was found that White Adipose Tissue represents a reservoir of lipophilic environmental pollutants, especially of those which are resistant to chemical and biochemical degradation so called POPs (Müllerová & Kopecký, 2007).

Therefore, weight loss has been shown to produce an increase in blood concentration of potentially toxic organochlorine pollutants like pesticides and Polychlorinated biphenyls (PCBs) in obese subject (Chevrier et al., 2000; Rouhou, Karelis, St-Pierre, & Lamontagne, 2016). In conclusion, toxic PCBs and related compounds are clearly released from stored fat and are in higher levels in the blood when losing weight. It has been shown also that the released toxins can depress the thyroid function (Richards, 2014).

2.1.3 Diet failure and effect of severe energy restriction

On the other side, results of random digit dial surveys indicate that around 20% of people in the general population are successful at long-term weight loss maintenance (Wing & Phelan, 2005).

This low percentage is due to many factors and explanations among which we can correlate dieting to a stressful experience comprising physically aversive feeling of hunger and deprivation of food, resisting temptation and energy restriction (Tomiyama, 2010). In addition, there is convincing evidence that stress stimulates appetite and weight gain through elevations of cortisol which is a stress-induced eating hormone (Nakamura, Walker, & Ikuta, 2016; Torres & Nowson, 2007).

Based on the work of Mazuraket (Mazurak et al., 2013) and Tomiyamaet (Tomiyama et al., 2010), it is possible that low-energy detox diets increase stress, elevate cortisol and stimulate appetite, thereby making it difficult to lose weight.

In addition, according to the Food and Agriculture Organization FAO, the overall minimum daily per person energy requirement is approximately 7.03 MJ (1680 kcal) (FAO, 2008). Also FAO/WHO (world Health Organization) recommends that adults should consume 133 mg nitrogen/kg per day or 0.83 g/kg body weight of high quality protein per day (WHO, 2007).

Severe energy restriction and nutritional inadequacy can lead to protein and vitamin deficiencies, electrolyte imbalance, lactic acidosis and even death (Johnstone, 2007; A. Klein & Kiat, 2015).

2.2 Detox evidence and demanding analyses

2.2.1 Overview on Chemicals

A normal healthy body can naturally detoxify itself and get rid of its own produced toxic wastes as fast as they are produced. Due to toxic overload or impairment of the body's own natural detox and elimination functions, toxemia occurs and the conditions of disease are therefore created when toxins are retained and stored in the body.

During any detox program, the organs of elimination (skin, liver, kidneys, colon, and bladder) must work overtime to process and excrete all the accumulated toxic wastes that are loosened and released from organs and tissues throughout the body (Reid, 2016).

Global industrialization has seen a marked rise in the number of chemicals to which we are exposed. In both the European Union (EU) and the USA, approximately 80 000 chemicals are currently in use (Brown, 2003; Walker, 2014). In the EU, regulation introduced in 2007 requires any chemical substance used or produced by companies to be registered[12]. For a chemical to be registered, the potential risks and hazards must be assessed (the amount of testing depends on the tonnage produced). To date, the European Chemicals Agency (ECHA) has registered approximately 17206 substances, meaning that there are thousands still to be tested (Gustavsson, Hellohf, & Backhaus, 2017). Till present the European Chemicals Agency identified (ECHA) 63 restricted substances for which manufacture, placing on the market or use is limited or banned in the European Union. A List of 173 substances of very high concern for Authorisation is published in accordance with Article 59 of the REACH Regulation (Genuis, 2011). In the USA, an estimated 2000 new chemicals are introduced into foods and consumer products every year, many of which have not been tested for adverse health effects (Walker, 2014).

2.2.2 Pollution and Industrialization effect

In his book "The Tao of Detox", Daniel Reid associates the pollution and industrialization effect with diseases and degenerative conditions. Accordingly, the only real way to cure the body is to eliminate the root cause by ridding the body of the toxins that pollute the blood and tissues, attract germs and weaken the resistance and immunity; The blood is constantly polluted by excess acid residues from wrong eating habits, alcohol and drugs, stress-hormones and other acid-forming factors. Acidosis and hypoxia (oxygen deficiency) are the primary conditions of imbalance that permit germs to breed, tissues to degenerate and cancer to develop. Excessive levels of acid residues in the blood and tissues suppress immune response, interfere with normal metabolism, inhibit digestion and assimilation, promote fungal arid bacterial infections and cause all sorts of other biological malfunctions and ill health (Reid, 2016).

It is well-established that some synthetic chemicals accumulate in the human body and that high doses can be toxic (Genuis, 2011; Wang, Asimakopoulos, & Kannan, 2015).

2.2.3 Evidence of eliminating toxins

The Centers for Disease Control and Prevention's Agency for Toxic Substances & Disease Registry defines detoxification as "the process of removing a poison or toxin or the effect of either from an area or individual."(Allen et al., 2011)

Although there is currently no evidence to support the use of commercial detox diets for removing toxic substances from the body, there are some preliminary studies suggesting that certain nutritional components possess detoxification properties (A. Klein & Kiat, 2015).

For example there is evidence that coriander, malic acid (found in grapes and wine), citric acid (found in citrus fruits), succinic acid (found in apples and blueberries), citrus pectin (found in the peel and pulp of citrus fruits) and Chlorella (a type of green algae) exhibit natural chelating properties, suggesting that they may be useful for the elimination of toxic metals (A. Klein & Kiat, 2015).

In general terms, the detoxification process involves two, potentially three, phases. CYP450 is the family of enzymes responsible for phase 1 (Jeffery, 2007).

In general, B vitamins, glutathione (the body's main detoxifying antioxidant), and flavonoids have been shown to assist phase 1 detoxification, whereas all major conjugation reactions in phase 2 require micronutrient coenzymes, including glycine, N-acetylcysteine (NAC), and B vitamins (Bralley E, 2008). For example, the phytochemicals that induce phase 2 enzymes can be found in cruciferous vegetables, onions, and garlic (Konsue & Ioannides, 2010). Fiber intake supports regular elimination, which is crucial for excreting toxins through the bile and stool, noting that brown rice fiber may be particularly beneficial in eliminating fat-soluble toxins. Turmeric/ curcumin has shown promise in protecting the gallbladder and promoting bile flow (Rasyid, 2002; Seo et al., 2015), and research has shown the potential for pomegranate/ ellagic acid in assisting detoxification pathways (Barch, Rundhaugen, Stoner, Pillay, & Rosche, 1996; Danesi et al., 2014).

Much research has focused on green tea's potential benefits in detoxification, and one study showed its particular promise in promoting the induction of phase 2 detox enzymes (Harrouff, 2012). Research has shown promise for various other foods in assisting the detoxification process, including high-quality proteins, artichokes, watercress, cilantro, and apples (Jeffery, 2007).

2.3 Celebrities' influence on patients' health-related behaviors and body image perception

Women generally have higher levels of body dissatisfaction than men. Body Dissatisfaction is associated with various health-related behaviors, some of which present significant health risks (Grogan, 2016). Pre-adolescent girls perceive ideal body figure in preference to be thinner (Collins, 1991).

Research, primarily conducted in the U.S., UK, and Australia, has obtained considerable evidence for media effects on thinness ideals and body dissatisfaction (Perloff, 2014); It has been suggested that media contributes to body dissatisfaction through the portrayal of unrealistic ideas (Grogan, 2016).

Much of the interest in detox cleansing and fasting can be attributed to celebrities like Salma Hayek and Ashton Kutcher who have made such behaviors socially acceptable and popular for weight loss and reducing gastrointestinal malaises. For reliers, many of their friends, family members and colleagues may follow or discuss celebrity medical advice, which indirectly encourages them to act similarly. For searchers, the information they gather may knowingly or unknowingly include advice from celebrities, especially as the internet burgeons with the health information they share. This means that all types of people, not just gossipmongers or people with low self-esteem can be affected by the ways celebrities shape the social construction and reconstruction of health information (Hoffman & Tan, 2015).

Some examples of detox diets promoted by famous celebrities include for instance "the 7-day Detox Diet" created by Gwyneth Paltrow which includes a mix of smoothies, salads, soups, fruits, seeds and nuts, fish, chicken, and whole grains.

Another detox diet is "the Master Cleanse" followed by Beyonce. This one also referred to as the lemonade diet consists of only consuming a lemonade-like drink made from fresh lemon or lime juice, maple syrup, cayenne pepper, and water (Yovino, 2016).

2.4 The new approach of detoxification in clinical practice

This new paradigm intrigued dietitians to integrate Detoxification in their diet program;
When applying a diet to lose weight, some dietitians use detoxification as an initial step, others incorporate it in their diet and some of them may use it as an option when the patients reach the so called “plateau”.
In a survey assessing the attitudes and uses of cleanse and detoxification diets by registered dietitians (RDs), it was found that 80% of RDs surveyed do not recommend cleanse/ detox diets although it was found that there is an increase curiosity in knowing more about detox from the patients (Herbold & Mulvaney, 2014).

In clinical practice, When determining whether a detoxification protocol may benefit a client, qualified RDs often assess a person’s toxic exposure and genetic profile with one or more of a variety of tools and tests such as blood or urine profiles for testing specific toxic accumulation in the body, gene panels done via blood testing or checking swab tests (Dupas & Dagorne, 2013).

However, the search for reliable biomarkers to accurately assess toxicity and chemical and environmental sensitivities continues (De Luca, Raskovic, Pacifico, Thai, & Korkina, 2011).

Encouraged by the research conducted so far, many integrative medicine nutritionists and other health professionals are including detoxification protocols in their clinical practice (Allen et al., 2011).

2.5 New paradigm in wellness and health centers

Most detox centers have been well known for rehabilitation from drug and alcohol addictions as well as smoking cessation. But nowadays we are more opt for centers offering wellness programs of integrated therapies, assessments, consultations and treatments including detox and weight loss, fitness, hypnotherapy, yoga, Ayurveda, spa… These programs are like a business enforced with marketing figures of weight loss in a short treatment period which makes them more and more appealing and popular.

2.5.1 Wellness and Health centers common therapy in treating obesity

Most of wellness and health centers treat obesity and weight management in a similar way, setting a referral program that addresses the problems of the overweight and obese, enabling them to regain control of their lives and their health by giving them the necessary life skills to lose weight and achieve a healthier lifestyle. The program most commonly includes individualized plans in a comprehensive and multidisciplinary way sensitive to the special needs of the overweight and obese, providing a comfortable and supportive environment through focused education and incorporation of lifestyle changes leading to an improved state of health. Some centres work on supplementation and non-invasive machines others provide necessary medical and surgical intervention so that the overweight and obese can successfully lose weight eliminating the diseases resulting from their excess weight.

2.5.2 Detox in wellness centres

Recently a new trend has been introduced to the wellness centres in the purpose of adding a new value for their services and decreasing the level of failure attributed to traditional diets. The main common target of these programs is to lose stubborn fat, decrease water retention, fight bloating and constipation.

At *Dermapro* for instance, a Wellness and Healthcare center in Lebanon, the concept of detoxification was first introduced in 2015; the detox process starts with an advanced body screening to determine the level of toxins, heavy metals and functionality of organs in the body. The screening is to be followed by a consultation with a clinical nutrition expert to determine the most adequate form of detox to follow. The consultation is succeeded by a machine-induced detox through the newly introduced “Iyashi Dome”. The latter is a revolutionary detox machine that helps blitz away the build-up of toxins and restores the body to its natural state of equilibrium. Other advanced therapies are used to enhance the detox treatment including the Pulsed Electro Magnetic Field Therapy (PEMF) and Ozone therapy. In-house nutritional experts also offer complimentary customized nutritional detox services and made-to-order juices and meals. Among the stated reasons to opt for detox program is that it promotes healthy weight loss while allowing the body to absorb the necessary aliments needed.

The "Iyashi Dome" detox machine is also introduced in November 2015 at a five-stars hotel (*Le Royal*) in Lebanon with a marketing claim that it helps to eliminate toxins and fat with a "drop down 2 dress sizes".

Other examples include *TermeKrka;* a medical wellness center in Slovenia which offers weight loss and detox programs through nutrition diets, exercises and massage therapies. The detox diet at *TermeKrka* is based on fasting methods.

SpaDreams offers a vast array of detox diet packages in luxury resorts in Europe. Most of detox programs include thermal water, fasting juice, hiking, Nordic walking, fasting therapy, yoga and much more, designed to help you make long-term changes towards a healthy lifestyle.

At *New Leaf detox Resort* in Thailand, programs are offered for weight loss based on fasting, Detox Juices, Smoothies & Soups, Supplements & Herbal Teas. Ozone therapy can also be used.

These centers use "detox" as a keyword to attract customers and patients to subscribe and be active members in their activities. Their increase and abundance is directly correlated to the customers need which in turn is based on success stories.

3 Method

The only paradigm that can lead to human development encompasses the old within the new (Hampden-Turner, 1996). The main target of nowadays detox diet is directly associated with weight management. So whether it is ancient, related to religion or even trendy and associated with weight loss, people who are following this kind of diet are searching for purification and elimination of toxins in a general point of view which has a positive influence on their health and enhance their metabolism.
To analyse the attitudes toward the role of detoxification, a quantitative analysis is conducted using descriptive statistical non-parametric method Chi-Square.

The attitudes of the respondents Yare analysed through comparing two groups with participants, who never used detox diet and with participants, who experienced the "detox" diet. Thus, the data of the attitudes of "detox" non-users will serve as the observed values, and the data of users of the "detox" diet will serve as the expected values in a statistical analysis of the attitudes of the respondents.

SAMPLE

The target group consists of 20 patients randomly selected from a diet clinic in Beirut, Lebanon. The patients are equally divided into two sub-groups aging between 20 and 45 years old, therefore the selected people are adults, all of them are Lebanese and none of them presents a history of drugs intake or smoking or alcohol addiction. There is no preference for

gender nor for ethnicity and religion and most of them are educated. So, their answers are independent of their age and their culture background.

The first group presents people who already experienced detox diet at least once along with their diet program. In the second group, we have patients who are following a regular diet program.

The same questions are asked to the two sub-groups as shown below and results are collected accordingly to check their different point of view and their position toward detox diet (see appendix).

INSTRUMENT

The respondents in the study are asked a set of questions in order to describe their attitudes towards a detox diet using ordinal scales.

Questionnaire of attitudes toward a detox diet

1. When do you think is the best time to follow a detox diet:
    a. After holidays / junk food diet
    b. When getting a bad result from lab tests
    c. When feeling down or lazy
    d. When having malaise / bloating / constipation / headaches
2. What is your expectation from detox plans
    a. Fitness and shape
    b. Health
    c. Peaceful mind and relaxation
3. Do you encourage your friends for a detox plan regularly?
    a. Yes
    b. No
    c. only if they need

4 Results

The results of the first sub-group in Table 1 show that 80 % of respondents are willing to take a detox therapy after holidays or as a therapy after having a period of junk food diet, 10 % follow a detox diet when having malaise, bloating, constipation or headaches,10 % are willing to take a detox therapy when they get a bad result second to a lab testing and none think about detox therapy as a mean to overcome the feeling of being down and lazy. 70% of the respondents in this study, expect better health after the treatment with a detox diet. Whereas 30 % expect to be more fit and in shape. Finally, 70% of patients who tried a detox diet are willing to encourage their friends to use it regularly only if they need it.

Table 1: Answers from patients who experienced detox diet

	1a	1b	1c	1d	2a	2b	2c	3a	3b	3c
P1	X				X					X
P2	X					X				X
P3	X					X				X
P4	X					X		X		
P5				X		X				X
P6	X					X				X
P7		X				X				X
P8	X					X		X		
P9	X				X					X
P10	X				X			X		
Sum	**8**	**1**	**0**	**1**	**3**	**7**	**0**	**3**	**0**	**7**

One can conclude that the experience of patients with a detox therapy is positive, especially when they try it after the holidays. It seems that they associate it with better health and well-being. However, the findings of the study show that majority of respondents use the detox diet when feeling bad or when they fear for their health, and not as habit of a healthy lifestyle.

As the results show, the aim of the patients is that the detox therapy is primarily as a tool to lose weight in order to be healthy. But on the other hand, they promote detoxification and advise others to follow it only upon need. Patients' answers showed their opinion about detox as an approach to lose weight in order to be healthy. But still they are not keen to follow it as a preventive method but rather when only they gain extra fat to feel healthy again.

The results of the second sub-group in Table 2 show that only 30% of respondents are willing to take a detox therapy after holidays, 30% follow a detox diet when having malaise, bloating, constipation or headaches and the same 10% are willing to take a detox therapy when they get a bad result second to a lab testing, whereas 30% feel that detoxification treats laziness and encourage positive well-being. The question concerning the expectation from detox diet has the same percentage as for the people who experienced detoxification (70% of the respondents expect better health whereas 30% expect to be more fit and in shape). Finally, 70% of patients who tried a detox diet are willing to encourage their friends to use it unconditionally and 20% encourage to follow this diet only if needed.

Table 2: Answers from patients who never experienced detox diet

	1a	1b	1c	1d	2a	2b	2c	3a	3b	3c
P1			X		X			X		
P2				X	X			X		
P3	X					X		X		
P4			X			X		X		
P5				X		X		X		
P6	X					X			X	
P7	X				X					X

P8		X				X		X		
P9			X			X				X
P10				X		X		X		
Sum	**3**	**1**	**3**	**3**	**3**	**7**	**0**	**7**	**1**	**2**

The second sub-group, which never before has experienced detoxification through a detox diet, expressed more enthusiasm towards trying detox diet. We found positive attitudes of users towards a detox method regarding health and detoxification, but there are differences between the attitudes of the users and the non-users.

Table 3: Observed vs. Expected Frequencies

Questions	**observed - non-users**	**expected - users**	**O - E**	**$(O-E)^2/E$**
1a	3,000	8,000	-5,000	3,125
1b	1,000	1,000	0,000	0,000
1c	3,000	0,000	3,000	0,000
1d	3,000	1,000	2,000	4,000
2a	3,000	3,000	0,000	0,000
2b	7,000	7,000	0,000	0,000
2c	0,000	0,000	0,000	0,000
3a	7,000	3,000	4,000	5,333
3b	1,000	0,000	1,000	0,000
3c	2,000	7,000	-5,000	3,571
Sum	30,000	30,000	0,000	16,030

Apparently, there is no significant difference of attitudes toward a detox diet between the users and non-users of it. The differences between the attitudes of non-users and users of a detox method are obvious, but not significant (Chi-Square = 16,02976; df = 9; p = 0,066267)

Yet, one can conclude that detox diet is not something appealing for the ones who went through it although they admit that it is an effective method to lose weight and get healthy. The same approach sounds to be seductive for the patients who didn't try it before in order to get healthy without specifying the right time to follow such diet.

5 Discussion of the results and the methodology

Twenty patients were involved in the qualitative research study. The findings showed a homogeneity in the vision of detox as a method to lose weight. The group has a Lebanese roots, so further studies may be needed to seek other nationalities' opinion from developed and third world countries. The assessment doesn't consider the types of detox assuming from the interviews that the patients were given professional and clinical advice eliminating by that the possibility of fad diets, therefore there was no further investigation with the patients who already tried them about their types and variety.

The outcomes emphasize on the new paradigm approach regarding the effectiveness of detoxification in losing weight and eliminating toxins which is reflected with a better health being. There is a general assumption that detox is a healthy method which could be considered frequently to recapitulate and stay on a track of a healthy lifestyle besides losing weight.

Considering the popularity of detox diets, consumers and medical professionals should be better informed about their possible risks and benefits, and legislation should be put in place to protect consumers from unsubstantiated claims.

Although it is plausible that energy-restricted detox diets are able to produce short-term weight loss, it is unclear whether these diets are useful for maintaining a healthy weight in the long-term. There is no doubt that sustained healthy habits are of greater long-term value than the quick fixes offered by commercial detox diets. (J. Klein & Murcott, 2014)

The importance of a sustained period of rest and relaxation as an absolute prerequisite for any detox program to be effective cannot be overemphasized, especially in today's fast-paced, high-stress world, where resting quietly, breathing and doing nothing is regarded as a "waste of time".

6 Conclusion

In conclusion**,** whether detox is attributed to rejuvenating, eliminating toxins, losing weight, increasing metabolism and promoting health, it is obviously clear that such therapy is facing success and development in the field of wellness clinics due to the increase need of customers which triggers the other wellness centers to follow the path and integrate it in their programs.

More studies are needed to deeper the investigation on testing in a scientific way while comparing the concentrations of toxins before and after detoxification and study effectively the relationship between toxins effect on metabolism and stubborn fat.

REFERENCES

1. Allen, J., Montalto, M., Lovejoy, J., & Weber, W. (2011). Detoxification in naturopathic medicine: a survey. *The Journal of Alternative and Complementary Medicine, 17*(12), 1175-1180.
2. Barch, D. H., Rundhaugen, L. M., Stoner, G. D., Pillay, N. S., & Rosche, W. A. (1996). Structure-function relationships of the dietary anticarcinogen ellagic acid. *Carcinogenesis, 17*(2), 265-269.
3. Bralley E, R. E. (2008). Laboratory markers of toxins and detoxification. Retrieved from http://www.metametrix.com/learning-center/presentations/2008/laboratory-markers-of-toxins-and-detoxification.http://www.metametrix.com/learning-center/presentations/2008/laboratory-markers-of-toxins-and-detoxification.
4. Brown, V. J. (2003). REACHing for chemical safety. *Environmental health perspectives, 111*(14), A766.
5. Burris, R. D. (2016). *Wisdom From Africa: Theological Reflections on the Confessions of St. Augustine*: Wipf and Stock Publishers.
6. Carty, T. (2015). History Of Detoxification.
7. Chevrier, J., Dewailly, E., Ayotte, P., Mauriege, P., Despres, J., & Tremblay, A. (2000). Body weight loss increases plasma and adipose tissue concentrations of potentially toxic pollutants in obese individuals. *International Journal of Obesity, 24*(10), 1272.
8. Collins, M. E. (1991). Body figure perceptions and preferences among preadolescent children. *International Journal of Eating Disorders, 10*(2), 199-208.
9. Danesi, F., Kroon, P. A., Saha, S., de Biase, D., D'Antuono, L. F., & Bordoni, A. (2014). Mixed pro-and anti-oxidative effects of pomegranate polyphenols in cultured cells. *International journal of molecular sciences, 15*(11), 19458-19471.
10. De Luca, C., Raskovic, D., Pacifico, V., Thai, J. C. S., & Korkina, L. (2011). The search for reliable biomarkers of disease in multiple chemical sensitivity and other environmental intolerances. *International journal of environmental research and public health, 8*(7), 2770-2797.
11. Dupas, D., & Dagorne, M. (2013). Multiple chemical sensitivity: a diagnosis not to be missed. *Revue des maladies respiratoires, 30*(2), 99-104.
12. FAO, F. (2008). Methodology for the Measurement of Food Deprivation: Updating the minimum dietary energy requirements: FAO: Rome.
13. Genuis, S. J. (2011). Elimination of persistent toxicants from the human body. *Human & experimental toxicology, 30*(1), 3-18.
14. Grogan, S. (2016). *Body image: Understanding body dissatisfaction in men, women and children*: Routledge.
15. Gustavsson, M. B., Hellohf, A., & Backhaus, T. (2017). Evaluating the environmental hazard of industrial chemicals from data collected during the REACH registration process. *Science of The Total Environment, 586*, 658-665.
16. Hampden-Turner, C. (1996). *Business Ethics: A European Review* (Vol. 4).
17. Harrouff, M. N. (2012). The Effect of Nutrigenomics Education on the Dietary Habits of College Students.
18. Herbold, N., & Mulvaney, A. (2014). A Survey of Attitudes and Use of Detoxification and Cleanse Diets by Registered Dietitians. *Journal of the Academy of Nutrition and Dietetics, 114*(9), A38.

19. Hoffman, S. J., & Tan, C. (2015). Biological, psychological and social processes that explain celebrities' influence on patients' health-related behaviors. *Archives of Public Health, 73*(1), 3.
20. Jeffery, E. H. (2007). Detoxification basics. *Alternative therapies in health and medicine, 13*(2), S96.
21. Johnstone, A. (2007). Fasting–the ultimate diet? *obesity reviews, 8*(3), 211-222.
22. Jones, K. C., & De Voogt, P. (1999). Persistent organic pollutants (POPs): state of the science. *Environmental pollution, 100*(1), 209-221.
23. Keith, P. (2016). *Desire to Change*: West Bow Pr.
24. Klein, A., & Kiat, H. (2015). Detox diets for toxin elimination and weight management: a critical review of the evidence. *Journal of Human Nutrition and Dietetics, 28*(6), 675-686.
25. Klein, J., & Murcott, A. (2014). *Food consumption in global perspective: essays in the anthropology of food in honour of Jack Goody*: Springer.
26. Konsue, N., & Ioannides, C. (2010). Modulation of carcinogen-metabolising cytochromes P450 in human liver by the chemopreventive phytochemical phenethyl isothiocyanate, a constituent of cruciferous vegetables. *Toxicology, 268*(3), 184-190.
27. Mazurak, N., Günther, A., Grau, F., Muth, E., Pustovoyt, M., Bischoff, S., . . . Enck, P. (2013). Effects of a 48-h fast on heart rate variability and cortisol levels in healthy female subjects. *European journal of clinical nutrition, 67*(4), 401-406.
28. Mohammadi, D. (2014). You can't detox your body. It's a myth. So how do you get healthy? Retrieved from https://www.theguardian.com/lifeandstyle/2014/dec/05/detox-myth-health-diet-science-ignorance
29. Müllerová, D., & Kopecký, J. (2007). White adipose tissue: storage and effector site for environmental pollutants. *Physiological research, 56*(4), 375.
30. Nakamura, Y., Walker, B. R., & Ikuta, T. (2016). Systematic review and meta-analysis reveals acutely elevated plasma cortisol following fasting but not less severe calorie restriction. *Stress, 19*(2), 151-157.
31. Perloff, R. M. (2014). Social media effects on young women's body image concerns: Theoretical perspectives and an agenda for research. *Sex Roles, 71*(11-12), 363-377.
32. Porter, S. (2016). Detox Diets Food Fact Sheet.
33. Rasyid, A., Rahman, A. R., Jaalam, K., &Lelo, A. . (2002). Effect of different curcumin dosages on human gall bladder. *Asia Pacific Journal of Clinical Nutrition, 11*(4), 314-318. doi:doi:10.1046/j.1440-6047.2002.00296.x
34. Reid, D. (2016). *The Tao of Detox: The Natural Way to Purify Your Body for Health and Longevity*: Simon and Schuster.
35. Richards, B. (2014). Detoxification During Weight Loss. Retrieved from http://www.wellnessresources.com/weight_tips/articles/detoxification_during_weight_loss/
36. Rouhou, M. C., Karelis, A., St-Pierre, D., & Lamontagne, L. (2016). Adverse effects of weight loss: Are persistent organic pollutants a potential culprit? *Diabetes & Metabolism, 42*(4), 215-223.
37. Sante, D. (2013). FOOD. Retrieved from http://ec.europa.eu/nuhclaims/
38. Sears, M. E., &Genuis, S. J. (2012). Environmental Determinants of Chronic Disease and Medical Approaches: Recognition, Avoidance, Supportive Therapy, and Detoxification. *Journal of Environmental and Public Health*, 1-15. doi:doi:10.1155/2012/356798

39. Seo, H.-J., Wang, S.-M., Han, C., Lee, S.-J., Patkar, A. A., Masand, P. S., & Pae, C.-U. (2015). Curcumin as a putative antidepressant. *Expert review of neurotherapeutics, 15*(3), 269-280.
40. Springen, K., Kuchment, A. (2008). Religious Origins of the Detox Diet. Retrieved from http://www.psy.miami.edu/faculty/mmccullough/Media%20Coverage/Religious%20Origins%20of%20the%20Detox%20Diet.pdf
41. Tomiyama, A. J., Mann, T., Vinas, D., Hunger, J. M., DeJager, J., & Taylor, S. E. (2010). Low calorie dieting increases cortisol. *Psychosomatic medicine, 72*(4), 357.
42. Torres, S. J., & Nowson, C. A. (2007). Relationship between stress, eating behavior, and obesity. *Nutrition, 23*(11), 887-894.
43. Walker, N., White, L., & Wolfe, M. . (2014). National Toxicology Program. Encyclopedia of Toxicology (pp. 464-467).
44. Wang, L., Asimakopoulos, A. G., & Kannan, K. (2015). Accumulation of 19 environmental phenolic and xenobiotic heterocyclic aromatic compounds in human adipose tissue. *Environment international, 78*, 45-50.
45. Weintraub, M. (1992). Long-term weight control study: Conclusions. *Clinical Pharmacology & Therapeutics, 51*(5), 642-646.
46. WHO. (2007). Protein and Amino Acid Requirements in Human Nutrition. *URL: http://apps. who. int/iris/bitstream/10665/43411/1/WHO_TRS_935_eng. pdf*.
47. Wing, R. R., & Phelan, S. (2005). Long-term weight loss maintenance. *The American journal of clinical nutrition, 82*(1), 222S-225S.
48. Yovino, K. (2016). 5 Detox Diets Celebrities Use to Lose Weight. Retrieved from http://www.cheatsheet.com/life/5-detox-diets-celebrities-use-to-lose-weight.html/?a=viewall

APPENDICES

Questionnaire of attitudes toward a detox diet

1. When do you think is the best time to follow a detox diet:
    a. After holidays / junk food diet
    b. When getting a bad result from lab tests
    c. When feeling down or lazy
    d. When having malaise / bloating / constipation / headaches
2. What is your expectation from detox plans?
    a. Fitness and shape
    b. Health
    c. Peaceful mind and relaxation
3. Do you encourage your friends for a detox plan regularly?
    a. Yes
    b. No
    c. only if they need

Table 1: Answers from patients who experienced detox diet

	1a	**1b**	**1c**	**1d**	**2a**	**2b**	**2c**	**3a**	**3b**	**3c**
P1	X				X					X
P2	X					X				X
P3	X					X				X
P4	X					X		X		
P5				X		X				X
P6	X					X				X
P7		X				X				X
P8	X					X		X		
P9	X				X					X
P10	X				X			X		
Sum	**8**	**1**	**0**	**1**	**3**	**7**	**0**	**3**	**0**	**7**

Table 2: Answers from patients who never experienced detox diet

	1a	**1b**	**1c**	**1d**	**2a**	**2b**	**2c**	**3a**	**3b**	**3c**
P1			X		X			X		
P2				X	X			X		
P3	X					X		X		
P4			X			X		X		
P5				X		X		X		
P6	X					X			X	
P7	X				X					X
P8		X				X		X		
P9			X			X				X
P10				X		X		X		
Sum	**3**	**1**	**3**	**3**	**3**	**7**	**0**	**7**	**1**	**2**

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