Assessment of Sugar Addiction among Non-Diabetic Patients

Naglaa Fawzy[1], Dalia Salah El-Deen[2]

[1.]Lecturer, Medical Surgical Nursing department, Faculty of Nursing, Cairo University, Cairo, Egypt
[2.]Assistant professor, Medical Surgical Nursing department, Faculty of Nursing, Cairo University, Cairo, Egypt

Abstract: **Sugar is an addictive substance that produces pathophysiological changes similar to those in drug addiction. The aim of the study was to assess sugar addiction level among non-diabetic patients. Two research questions were formulated to fulfill the aim of this study: a- What is sugar addiction level among the study sample? b-What are the demographic and medical characteristics of sugar addiction patients? A descriptive exploratory research design was utilized. The study was conducted at one medical and one surgical ward in a big teaching hospital in Egypt. A convenient sample of 200 adult male and female patients was collected over a period of three months. Two tools were used to collect data: (1) Demographic and medical related data sheet (2) Sugar Addiction Questionnaire Sheet. Results of the study revealed that, the majority of the study sample had moderate to severe sugar addiction level. Moreover, age, gender, income per month, and Body Mass Index showed to be the variables that had significant impact on sugar addiction response. The study recommended including the concept of sugar addiction in the nursing curriculum as a new health problem concept.**

Keywords: **Sugar, addiction, non-diabetic.**

I.   INTRODUCTION

Sugar is a symbol of love and nurturance. As infants, the first food is lactose, or milk sugar, after weaning, it continues to "nurture" the human with sugar treats, which become an incentive method that may lead to consuming sugar in order to feel satisfaction. Sugar addiction is considered the first type of addiction for persons (Worrells, 2016). The Society for Neuroscience reported that sugar may trigger a similar biochemical system of rewards in the brain that leads to addiction of substances like heroin (Koping , Noakes, & Thomson, 2015).

Many researchers concluded that sugar can be even more addicting than cocaine. Sugar whether in its simple form or a complex form as fructose motivates the opiate receptors in the brain and stimulate the reward center that leads to compulsive behavior. Consuming sugar sparks the nucleus accumbens , the area of the brain often referred to as the "reward center ." When the nucleus accumbens is stimulated, it releases dopamine (Yang, Zhang, & Gregg, 2014). Dopamine is sometimes called the reward chemical as it produces sense of pleasure and also, it is the same chemical that's released when alcoholic drinks, or cocaine and other addictive drugs are used. Additionally, sugar increases secretions of serotonin hormone that plays a role in mood (De Koning, Malik, Kellogg, Rimm, &Willett, 2013).

Several studies submit that eating sweets usually activate the neuropathway, and like any other addictive substances, the brain increasingly hardwired to consume sweets as a tolerance developed. Dopamine receptors become less sensitive to the presence of sugar and, over time the brain requires more sugar in order to generate the same amount of dopamine, and the addiction to sugar grows stronger. Indeed, research on rats has revealed that sweets stimulate neurons in the pleasure center than cocaine does and under certain conditions, the rats become dependent on sugar, as well as, symptoms of withdrawal were associated (Lustig, 2013).

Persons with sugar addiction can experience similar withdrawal-like symptoms when sugar intake is abruptly stopped. For instance, sugar addiction persons may suffer from anxiety or shakiness if they didn't consume adequate sugar intake,

which may indicate that the brain feel the need for more of the substance. However, these manifestations can't cause physical harm as the symptoms of alcohol withdrawal (Sen et al., 2013).

Like alcohol, drug, gambling and sex addictions, sugar addiction can influence the physical and mental health of persons (Serge, Karine, & Youna, 2013). Despite the harmful consequences such as weight gain, headache, hormone imbalance, chief among the terrible consequences of excessive sugar intake are obesity (Te Morenga, Mallard & Mann, 2013; Hu & Malik, 2010), diabetes (Basu, Yoffe, Hills, & Lustig, 2013), metabolic syndrome, liver disease, and high blood pressure (Judy, 2014). Sugar impacts on mental health; in particular, has been linked to the development of anxiety, depression and behavioral problems (Millichap, & Yee, 2012).

Furthermore, excess sugar can increase fat, as well as heart disease. Moreover, it plays a role in prognosis of cancers (Yang, Zhang, & Gregg, 2014). Nurses are critical thinkers with special teaching, psychomotor and communication skills, negotiation, coordination, and collaboration abilities in order to deliver care. They play a pivotal role in health promotion through giving health and wellness information and addiction counselling. Therefore, the aim of the present study was to assess sugar addiction level among non-diabetic patients.

SIGNIFICANCE OF THE STUDY

Many people realize the consequence of sugar on obesity, but its ability to disturb mood hormones can force some individuals to engage in addictive behavior. Just as an addict fails to control his/her ability to control consumption, persons who eat too much sugar may eat uncontrollably, often denoted as binge eating. Also, it may seem as sugar addiction is relatively safe compared to other addictive substances. Conversely, consuming too much sugar can cause severe consequences such as, cardiovascular problems, metabolic problems as well as mental problems (Serge, Karine, & Youna, 2013).

Nurses have a unique role in helping such patients to understand their condition and therefore seek the treatment options. Because, the nurses should use evidence-based knowledge to design the plan for management; therefore, descriptive data should be available first. Unfortunately, few studies were done regarding sugar addiction and the majority of them were animal studies particularly on rates. Therefore, it is imperative to conduct studies to assess such a problem. The results of such studies may help to contribute in the treatment plan for those patients. The nurse's role will expand to include exploration and screening of the sugar addiction patients which hoped to contribute to earlier intervention to prevent the consequences of complication.

II.   METHODOLOGY

AIM OF THE STUDY

The aim of the current study was to assess sugar addiction level among non-diabetic patients.

RESEARCH QUESTIONS

To fulfill the aim of the current study, the following research questions were formulated:

a- What is sugar addiction level among the study sample with different health problems?

b-What are the demographic and medical characteristics of sugar addiction patients?

DESIGN

A descriptive exploratory research design was utilized to fulfill the aim of the study and answer the stated research questions.

SETTING

The study was conducted at one medical and one surgical ward in a big teaching hospital in Egypt.

SAMPLE

For the study, a convenient sample of 200 adult male and female patients was collected over a period of three months, from one medical and one surgical ward of the teaching hospital. Adult patients who agreed to participate in the study and

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fulfilling the following criteria: having either chronic or acute illness, aged above 18 years, able to communicate in order to express the response to sugar addiction questionnaire, and had score of more than 3 on the Sugar Addiction Questionnaire constituted the study sample. While exclusion criteria, include patients had diabetes, sickle cell anemia, smokers, any psychiatric disorder and/or history of addiction and had score of 3 or less on the Sugar Addiction Questionnaire.

TOOLS

Data of this study were collected using the following tools:

1. **Demographic and medical related data sheet:** This sheet included questions related to demographic data as; age, gender, marital status, level of education, occupation, place of residence, as well as, medical data such as type of disease, diagnosis, and BMI were also recorded.

2. **Sugar Addiction Questionnaire**: The tool was designed by the researchers based on extensive literature review; it consisted of 20 items asking about the action and reaction in the presence or absence of sugar in the daily life. Patients should answer all questions utilizing "No" (zero score), or "Yes" (one score), with a total scores of 20. Scoring system for this questionnaire is classified into four categories: 1) From 0-3 is considered healthy, 2) From 4-9 is considered mild sugar addiction, 3) From 10-15 is considered moderate sugar addiction, and finally 4) From16-20 is considered severe addiction to sugar.

TOOL VALIDITY AND RELIABILITY

Five panel of experts from medical surgical nursing department revised the designed tools to test the content validity. Modifications were done based on their judgment. Cronbach's Alpha reliability test was performed, and it was 0.805.

ETHICAL CONSIDERATION

Once official approval from the director of the hospital was obtained, all patients received full explanation about the aim and benefit of the study, and then informed consent was taken. The researchers assured patients about ethical principles and that anonymity and confidentiality were assured through coding of the data. They emphasized that participation in the study is entirely voluntary and that withdrawal at any stage of the study is allowed even without giving any reason and will not have any effect on the care provided to them.

PILOT STUDY

Once permission was granted to proceed with the proposed study, a total of 25 adult patients were selected to be piloted in order to test feasibility, clarity, and comprehensiveness of the developed tools and to estimate the time needed to fill in the tools and respond to questions. Finally, modifications were done based on the results. The initial time needed was 20 -25 minutes. The piloted sample was excluded from the main study sample.

PROCEDURE OF THE STUDY

Once permission was granted to proceed with the proposed study, all patients admitted to the selected medical and surgical wards were assessed for three consecutive months. The total number of patients admitted was 431 patients, out of them 166 were diabetics, 21 their age was less than 18, and 7 patients refused to participate in the study, therefore all these patients were excluded from the study sample. The total number of patients meeting the inclusion criteria and willing to participate in the study was 237 patients. These patients were interviewed individually. Sugar addiction questionnaire was applied to them, and those who had score less than three (37 patients) were excluded from the study.

The total sample included in the current study was 200 patients. The researchers then calculated the BMI to classify patients into categories based on their weight and height (WHO, 2012). Those with BMI below 18.5 are classified as underweight, while those with BMI ranging from 18.5 to 24.99 are considered within the normal weight range, those with BMI from 25 to 29.99 are classified as overweight, and a BMI over 30 is considered obese. Data were collected by the researchers through face to face interview using the structured questionnaire.

Prior to the initial interview, the researchers introduced themselves to eligible patients; each potential patient was fully informed with the purpose and nature of the study, and then an informed consent was taken from those who agree to

participate. Each question was addressed one by one, with the researchers, and the choices of answers from patients were documented by the researchers. Total time consumed by each respondent was 20-25 minutes. The data collection phase started in March to May 2018.

STATISTICAL ANALYSIS

Data were collected, and then entered to a database file. Statistical analysis was performed using the statistical package for social science (SPSS), version 20. Frequency and percentage distribution were used to describe the sample and their responses to the questionnaires. t-test, and ANOVA test were used to find out the statistical significance of the difference between study sample, and r-test was used to examine the relationship between variables. Statistical significance was considered at P- value ≤ 0.05

III. RESULTS

Findings of the current study are presented in three sections: Section-1 describes the study participants' demographic characteristics and medically related information. Section-2 indicates the sugar addiction level among patients with different health problems; Section-3 shows the demographic and medical characteristics of sugar addition patients.

SECTION (1) DEMOGRAPHIC DATA AND MEDICALLY RELATED INFORMATION

Table (1): Frequency and Percentage Distribution of the Demographic Characteristics among the Study Sample (n = 200).

Variables	Frequency	Percentage
Age:		
18 - < 30 years	106	53.0
30 - < 40 years	49	24.5
40 - < 50 years	27	13.5
50 +	18	9.0
Mean $\pm$ SD	30.6 ± 12.7	
Gender:		
Male	37	18.5
Female	163	81.5
Marital status :		
Single	101	50.5
Married	67	33.5
Divorced	28	14.0
Widowed	4	2.0
Level of education:		
Not educated	3	1.5
Educated	197	98.5
Occupation:		
Working	71	35.5
Not working	129	64.5
Place of Residence:		
Urban	174	87.0
Rural	26	13.0

Regarding the participants' age, 53% had an age range between 18 to less than 30 years with a mean age ± SD: 30.6±12.7. The female gender was predominant and represented 81.5%. In relation to marital status, 50.5% of the patients were single, and 98.5% of the sample were educated. In addition, 87% reside in urban areas, while 64.5% were not working.
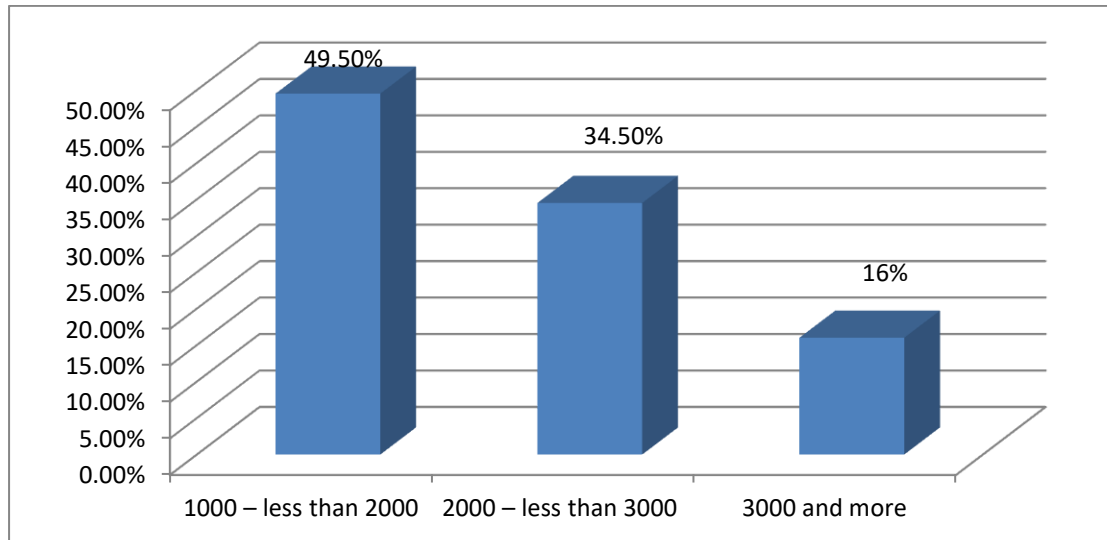
Figure (1): Percentage Distribution of Income per Month/ Egyptian pound

Figure (1) shows that 49.5% of the study sample had an income of less than 2000 Egyptian pound per month.

Table (2): Frequency Distribution of Medical Related Data among the Study Sample (n = 200).

Variables	Frequency	Percentage
Type of disease:		
Acute	74	37.0
Chronic	126	63.0
*Medical diagnosis		
Hypertension	107	53.5
Peptic ulcer	46	23.0
Chronic Obstructive Pulmonary Disease (COPD)	27	13.5
Heart failure	8	4.0
Renal failure	35	17.5
Appendectomy	28	14.0
Cholecystectomy	25	12.5
BMI category:		
Under weight	13	6.5
Normal weight	87	43.5
Over weight	55	27.5
Obese	45	22.5

*The variable is not mutually exclusive

Table (2) shows that regarding type of disease, 63% had chronic disease, with 53.5% of the sample suffer from hypertension. In relation to body mass index, 43.5% of the patients had normal body weight.
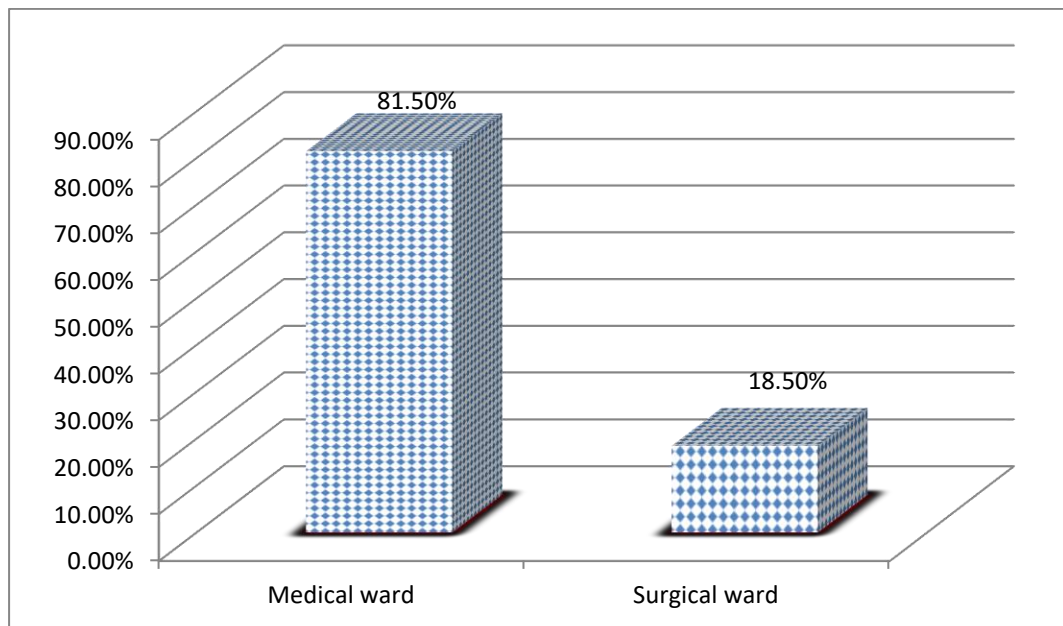
Figure (2): Percentage Distribution of the Patients According to Admission Wards (n = 200).

Figure (2) shows that 81.5% of the studied sample were admitted to the medical ward, while, 18.5% were admitted in the surgical ward.

SECTION-2 SUGAR ADDICTION LEVEL AMONG STUDY SAMPLE:

Table (3): Frequency and Percentage Distribution of Responses of the Study Sample Regarding Sugar Addiction (n = 200).

Variables	Yes		No	
	No.	%	No.	%
Having a sense of pleasure when eating sweets.	148	74	52	26
Sugar has an extraordinary control over the psychological state.	71	35.5	129	64.5
Feeling better when eating sugary food even in a bad day.	76	38	124	62
Insisting to purchase sweet food even it is late at night or having obstacles.	39	19.5	161	80.5
Feeling guilty after eating sugary foods.	103	51.5	97	48.5
Eating sweets is at everyday schedule.	72	36	128	64
Always eating sweets while alone.	65	32.5	135	67.5
Thinking about what sweets will be eaten next.	45	22.5	155	77.5
Stockpile sweets a home habit.	113	56.5	87	43.5
Feeling depleted after eating too much sweet.	42	21	158	79
Failing to limit the amount of eating sweets	76	38	124	62
Suffering from physical /psychological problems when deprived of sweets for a long period of time.	31	15.5	169	84.5
Hiding the amount of sweets eaten	30	15	170	85
Worrying about eating sugar affect health–but eating it anyway.	94	47	106	53
Feeling crash in the afternoon if sweets did not eat.	37	18.5	163	81.5
Experiencing crust in the corner of the eyes when wake up.	54	27	146	73
Eating the whole sweet food box until it's gone.	71	35.5	129	64.5
Celebration is not a celebration unless sweets are involved.	117	58.5	83	41.5
Preferring to sacrifice eating good foods instead to eat sweets	142	71	58	29
Loving sweets part of the personality.	43	21.5	157	78.5

Table (3) shows the responses of the participants regarding sugar addiction, whereas, the item that had higher frequency was experience sense of pleasure when eating sweet (74%), followed by sacrifice eating good food to eat sugary food (71%), then the item regarding a celebration had to have sweets (58.5%), and finally there is Stockpile sweets a home habit represented (56.5%).

Table (4): Frequency and Percentage Distribution of Total Score of the Sugar Addiction Responses of Study Sample (n= 200).

Total scores of sugar addiction responses	Frequency	Percentage
Mild sugar addiction level (4 – 9).	37	18.5
Moderate sugar addiction level (10 – 15).	106	53.0
Severe sugar addiction level (16-20)	57	28.5

Table (4) shows that 53% of the studied sample had moderate sugar addiction level, and 28.5% were severely addicted to sugar.

SECTION (3): DEMOGRAPHIC AND MEDICAL CHARACTERISTICS OF SUGAR ADDICTION PATIENTS.

Table (5): Comparison of Responses of the Study Sample in Relation to Demographic Characteristics (n = 200).

Demographic characteristics		Mild sugar addiction level		Moderate sugar addiction level		Severe sugar addiction level	
		No.	%	No.	%	No.	%
Age	18 - < 30	14	7	55	27.5	37	18.5
	30 - < 40	13	6.5	25	12.5	11	5.5
	40 - < 50	6	3	14	7	7	3.5
	≥ 50	4	2	12	6	2	1
Gender	Female	27	13.5	85	42.5	51	25.5
	male	10	5	21	10.5	6	3
Marital status	Single	16	8	54	27	31	15.5
	Married	14	7	35	17.5	18	9
	Divorced	6	3	15	7.5	7	3.5
	Widowed	1	0.5	2	1	1	0.5
Educational level	Non- Educated	1	0.5	0	0	2	1
	Educated	36	18	106	53	55	27.5
Residence	Urban	30	15	93	46.5	51	25.5
	Rural	7	3.5	13	6.5	6	3
Work	Work	17	8.5	37	18.5	17	8.5
	Non- Work	20	10	69	34.5	40	20
Income per Month	1000<2000	19	9.5	48	24	32	16
	2000<3000	16	8	39	19.5	14	7
	≥ 3000	2	1	19	9.5	11	5.5

Table (5) revealed that 27.5% of the studied sample aged between 18 to less than 30 years, had moderate sugar addiction level and 18.5% had severe sugar addiction level. Meanwhile, 42.5% of the patients were female and had moderate sugar addiction level, and, 25.5% of females had severe sugar addiction level. Regarding marital status, 27% of the studied sample were single and had moderate sugar addiction level, while 17.5% of the sample were married and had moderate sugar addiction level.

Educational level of the studied sample revealed that 53% of them were educated and had moderate sugar addiction level. In relation to residence, 46.5% of those residing in urban areas had moderate sugar addiction level. Working profile of the sample shows that 34.5% were not-working and had moderate sugar addiction level. Moreover, 24% had income from 1000 to less than 2000 Egyptian pound per month, and had moderate sugar addiction level.

Table (6): Comparison of Responses of the Study Sample in Relation to Medical Related Information (n = 200).

Medical related information		Mild sugar addiction level		Moderate sugar addiction level		Severe sugar addiction level	
		No.	%	No.	%	No.	%
B M I category	Under Weight	3	1.5	7	3.5	3	1.5
	Normal weight	21	10.5	43	21.5	23	11.5
	Over weight	7	3.5	28	14	20	10
	Obese	6	3	28	14	11	5.5
Ward	Medical	32	16	83	41.5	48	24
	Surgical	5	2.5	23	11.5	9	4.5
Type of diagnosis	Acute	16	8	42	21	16	8
	Chronic	21	10.5	64	32	41	20.5
Medical diagnosis	Hypertension	29	14.5	48	24	30	15
	Peptic ulcer	13	6.5	19	9.5	14	7
	Chronic Obstructive Pulmonary Disease	5	2.5	9	4.5	13	6.5
	Heart failure	1	0.5	6	3	1	0.5
	Renal failure	9	4.5	15	7.5	11	5.5
	Appendectomy	8	4	8	4	12	6
	Cholecystectomy	7	3.5	10	5	8	4

Looking closely to table (6), it is obvious that 21.5% of patients had normal weight and suffer from moderate sugar addiction level, while 41.5% had medical health problems with moderate sugar addiction level. Moreover, 32% of the studied sample who had chronic disease suffer from moderate sugar addiction level, followed by 20.5% who had also chronic disease are severely addicted to sugar. Medical diagnosis revealed that 24% of the studied sample who had hypertension, suffer from moderate sugar addiction level.

Table (7): Correlation between Total Score of Patients' Sugar Addiction Responses and Selected Demographic and Medical Data (n = 200)

Variables	Patients' sugar addiction responses	
	Pearson Correlation	P-value
Age	-0.136	0.055*
B M I	-0.454	0.001*
Income per Month	-0.195	0.006*

*p-value ≤ 0.05

Table (7) shows that there were statistically negative correlations between age (r- test= -0.136, p-value= 0.055), BMI (r-test= -0.454, p-value= 0.001) and income per month (r- test= -0.195, p-value: 0.006) and total score of patients' sugar addiction responses.

Table (8): ANOVA Test between Total Score of Patients' Sugar Addiction Responses and Selected Demographic and Medical Data (n = 200).

Variables	Patients' sugar addiction responses	
	F	P-value
Marital status	0.505	0.604
Educational level	0.450	0.639
Medical diagnosis	0.51	0.601

P-value ≤ 0.05

Table (8) revealed that there were no statistically significant differences between total score of patients' sugar addiction responses and marital status (F-test= 0.505, p-value= 0.604), educational level (F-test= 0.450, p-value= 0.639) and medical diagnosis (F-test= 0.51, p-value= 0.601).

Table (9): Mean Differences between Total Score of Patients' Sugar Addiction Responses and Selected Demographic and Medical Data (n = 200).

Variables		No.	Mean	t-test	p-value
Gender	Female	163	1.29	2.054	.043*
	Male	37	1.11		
Place of residency	Urban	174	1.13	0.072	.943
	Rural	26	1.14		
Work	Work	71	1.51	1.692	.095
	Not Work	129	1.69		
ward	medical	163	1.22	0.953	.344
	surgical	27	1.14		
Type of Diagnosis	Chronic	126	1.49	1.692	.095
	Acute	**74**	**1.31**		

P-value ≤ 0.05

Table (9) shows that there was only a statistically significant difference between males and females in relation to total score of patients' sugar addiction responses (t-test= 2.054 at p-value= 0.043).

IV. DISCUSSION

Sugar addiction is considered as one of the most important and widespread addiction types on earth today and is getting worse day by day. Regarding description of the demographic related information of the studied sample, results revealed that more than three fourth of the study sample had age less than forty years, female gender was dominant among the sample, and almost half of the study sample was single. Approximately, all the patients were educated, the majority were residing in urban areas, with less than two third of them had no work. About half of the sample had family income less than 2000 pounds per month. In addition, the medical profile showed that more than three fifth of the study sample suffered from chronic disease, and around half of them had normal body weight.

The study findings revealed that, about half of all patients admitted to the selected medical and surgical wards were addicted to sugar but with varied levels, in which the majority of them suffered from moderate to severe sugar addiction levels. These results may indicate the seriousness of the sugar addiction as a health problem.

Supporting the current study findings, are those of the study carried out by Westwater, Fletcher & Ziauddeen, (2016), which showed similar results between sugar and food addiction, as some of their study sample reported loss of control and cravings, while others withdraw due to food' problem. Previously, the problem with foods was linked to corn, milk, eggs and potatoes, but the modern view is foods rich in sugar and fat are most likely to be addictive. Few studies have studied the addictive potential of sugar, but the current study results supported the existence of sugar addiction as a new health problem. A research done on sugar, found that sugar is an addictive substance because of its effects on the nervous system of the brain, the effect on the nervous system which derived from sugar was similar to the opium addiction (Jumnongkul, Mongkolchati, Buntup, & Rattanapan, 2015).

The current study shows that, there was a statistically significant difference between males and females regarding sugar addiction, whereas, females had higher mean sugar addiction score when compared to males. The researchers in the current study believe that, this could be due to the female hormone which promotes this craving for sweets especially during the menstrual cycle. As the literature review reported that estrogen plays a significant role in changes of sweet consumption especially during the menstrual cycle (Donfrancesco, Noce, & Brignoli, 2014).

Contrary to the current study findings, previous studies on gender differences revealed that although males and females tend to be the same in sugar addiction level, men prefer taking high concentrated sweets as compared to women

(Berenson, Laz, Pohlmeier, Rahman, & Cunningham, 2015). This finding also supports the result of an earlier research done in Italy, which found that male ate food rich in sugar more frequently than females (Lafay, Thomas, & Mennen, et al., 2015). Another study conducted by Jumnongkul, Mongkolchati, Buntup, & Rattanapan (2015), to assess factors affecting sugar addiction behavior among high school students in Kanchanaburi province, Thailand, the study findings showed no statistically significant association between gender and sugar addiction among the study patients.

Regarding age, there was a statistically negative correlation between sugar addiction and age, whereas, younger patients had higher sugar addiction scores. Moreover, patients aged less than thirty years showed significant higher addiction score when compared to those who were more than thirty years. These results can be explained as young persons had higher preference of sweet intake than do elderly ones, this can be related to the increased caloric requirements needed for growth or they may do work that requires more muscle efforts. Another explanation could be that young age is not commonly associated with the prevalence of chronic diseases, so there are no restrictions on the type of food taken that may lead to eat sweet freely. Speaking in the same line was the study conducted by Sia, et al., (2013), who found that sugar addiction is changing over the life span, and older women are expected to have less addiction to sweet foods compared with younger women.

It is commonly assumed that people complaining of addiction to sweet foods, consequently suffer from obesity. Unexpectedly, the study results showed a negative correlation between sugar addiction and BMI, whereas sugar addiction increased when BMI decreased. In other words, a normal body weight showed significant higher addiction level to sweet foods than the overweight and obese patients. The researchers may argue that normal weight people feel free to consume sugar than those who are overweight or obese, because obese patients are more likely to be careful about their weight and diet by keeping away from sugary food. Another explanation may be because the majority of the study sample were young, and young people tend to eat sweets more than older. A third explanation, may be due to that those patients had a considerable amount of physical activities that allow to burn these calories coming from consuming sugary food, which may lead to keep them within normal body weight, especially that most of them were young and in the productive period of life.

This result is supported by another study which showed that lean people prefer sweet food such as sugar, compared with obese people (Westwater, Fletcher, & Ziauddeen, 2016). However, the relationship between Body Mass Index (BMI) and sugar addiction was investigated. The hypothesis that persons with a higher BMI had more addiction to sugar than those with a lower BMI was not found (Decline, 2016; Hodgson & Stapleton, 2014).

Income per month was found to be negatively correlated to sugar addiction, whereas, those who had lower income had higher sugar addiction scores. This may be interpreted as, sweaty foods are relatively cheap as well as they give a sense of fullness. Taking a look at the price of some foods in the stores, it was obvious that healthier foods, organic, or sugar-free foods have a higher cost. This increases the chances that, the consumer, will continue to purchase these foods because they taste good and they are cheaper for the budget.

Moreover, the study findings concluded that marital status, educational level, place of residence, work status, and medical diagnosis, as well as type of disease have no statistically significant effect on sugar addiction scores. Contrary to some results of the current study findings and supporting the rest of results, a study conducted by Thompson et al. (2010), examining the relationships of sugar intake, and socioeconomic status in adults in the United States revealed that sugar addiction was higher among males than females and inversely related to age, educational status, and family income. Family income and educational status are independently associated with addiction to sugar. Patients with low income and education are vulnerable to sugar addiction. In addition, a cross-sectional survey of health behaviors, including food addiction among 18 to 40 year-old low-income women attending reproductive-health clinics showed that, the prevalence of sugar addiction did not differ by age group, education, income, or body mass index categories (Berenson, Laz, Pohlmeier, Rahman, & Cunningham, 2015) .

V.   CONCLUSION

The study findings revealed that approximately about half of all patients that admitted to the selected medical and surgical wards are addicted to sugar, which may indicate the seriousness of the sugar addiction as a health problem. In addition,

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the study findings concluded that the majority of the study sample had moderate to severe sugar addiction. Moreover, age, gender, income per month, and BMI were found to be the variables that had significant impact on sugar addiction level.

VI. RECOMMENDATIONS

As the sugar addiction is a newly emerged concept in medical field, based on the study findings, the following recommendations are suggested:

1. The concept of sugar addiction must be integrated into the nursing curriculum

2. Assessment of sugar addiction must be endorsed as a nursing role for patients with different health problems

3. Further studies may be needed to assess the prevalence of the sugar addiction in order to estimate the magnitude of the problem.

4. To enhance and reinforce further studies to investigate the correlational factors that may contribute to sugar addiction.

5. Future researches are needed to investigate sugar addiction in both a clinical and community population, to examine differences in the sugar addiction experience across cultures and diagnoses.

6. Replication of the study on a larger study sample in different settings to generalize the results.

VII. NURSING IMPLICATIONS

Sugar addiction is an innovative concept, therefore the current research is considered as a gate to open new field for further researches, either assessment or intervention researches. Moreover, there is growing emphasis on the role of the nurse in primary prevention that aims to prevent disease or injury before it ever occurs. Therefore, the nurse would have a pivotal role in assessing risk factors of health problems in order to reduce the risk of complications.

Considering implications for nursing education, assessment of sugar addiction would provide a framework and content to be taught in basic and continuing educational programs as a primary preventive practice for the health professionals.

ACKNOWLEDGEMENT

REFERENCES

[1] Basu, S., Yoffe P., Hills, N., & Lustig, R.H. (2013). The relationship of sugar to population-level diabetes prevalence: An econometric analysis of repeated cross-sectional data. PLoS One; 8(2):e57873.

[2] Berenson, A.B., Laz, T.H., Pohlmeier, A.M., Rahman, M., & Cunningham, K.A. (2015). Prevalence of Food Addiction Among Low-Income Reproductive-Aged Women. Journal Women's Health (Larchmt). Sep 1; 24(9): 740–744.

[3] Decline, S.C. (2016). Physical activity to blame for rise in obesity [homepage on the Internet]. Institute for Economic Affairs. [cited 2018 Apr]. Available at: https://iea.org.uk/in-the-media/media-coverage/decline-in-physical-activity-to-blame-for-rise-in-obesity.

[4] De Koning, L., Malik, V.S., Kellogg, M.D., Rimm, E.B., Willett, W.C., & Hu, F.B. (2013). Sweetened beverage consumption, incident coronary heart disease, and biomarkers of risk in men. Circulation; 125(14):1735-1741.

[5] Donfrancesco, C., Noce, C.L., Brignoli O. (2014). Italian network for obesity and cardiovascular disease surveillance: A pilot project. BMC Fam Pract.; 9: 53 doi:10.1186/1471-2296-9-53.

[6] Hodgson, K. & Stapleton, P. (2014) Predicting food cravings: A piece of cake or a hard nut to crack? The New School Psychology Bulletin, 11 (1), 30-41: ISSN 1931-793X.

[7] Hu, F.B., & Malik, V.S. (2010). Sugar-sweetened beverages and risk of obesity and type 2 diabetes: Epidemiologic evidence. Physiol Behav.; 100 (1): 47-54.

[8] Judy, C. (2014). "Eating too much added sugar increases the risk of dying with heart disease - Harvard Health Blog." Harvard Health Blog RSS. N.p., 6 Feb.

[9] Jumnongkul, C., Mongkolchati, A., Buntup, D. & Rattanapan, C. (2015). Factors affecting sugar addiction behavior amonghigh school student in Kanchanaburi Province, Thailand. Proceedings of 34th. The IIER International Conference, Singapore, 19th August 2015, ISBN: 978-93-85465-79-6 -mail: cheerawit.rat@mahidol.ac.th, cheerawit@hotmail.com

[10] Koping, R., Noakes, T., & Thomson, K., (2015). Sugar addiction programme launched. Press release, October.

[11] Lafay, L., Thomas, F., Mennen, L., et al. (2015). Gender differences in the relation between food cravings and mood in adult community. Int J Eat Disord; 29: 195–204.

[12] Lustig, R.H. (2013, March). Fructose: It's "alcohol without the buzz." Advances in Nutrition; 4, 226-235.

[13] Millichap, J., & Yee, M. (2012). The diet factor in attention-deficit/hyperactivity disorder, the American Academy of Pediatrics; 129, 2.

[14] Sen S., et al., (2013). Glucose regulation of load-induced mTOR signaling and ER stress in mammalian heart, J Am Heart Assoc; 2(3).

[15] Serge, A., Karine, G., & Youna, V. (2013). Sugar addiction: Pushing the drug-sugar analogy to the limit, Current Opinion in Clinical Nutrition and Metabolic Care; 16 (4), 434–439.

[16] Sia, B.T., Low, S.Y., Foong, W.C., Pramasivah, M., Khor, C.Z. & Say, Y.H. (2013). Demographic differences of preference, intake frequency and craving hedonic ratings of sweet foods among Malaysian subjects in Kuala Lumpur. Malaysian Journal of Medicine and Health Sciences (ISSN 1675-8544); 9 (1, January) : 55-64.

[17] Te Morenga, L., Mallard, S., & Mann, J. (2013). Dietary sugars and body weight: systematic review and meta-analyses of randomized controlled trials and cohort studies. BMJ.;346:e7492.

[18] Thompson, F.E., McNeel, T.S., Dowling, E.C., Midthune, D., Morrissette, A. & Zeruto, C.A. (2010). Dietary requirements and role in brain development. Journal of American Diet ssocation. 2010 Aug; 109(8): 1376–1383.

[19] Westwater M.L., Fletcher, P.C., Ziauddeen, H. (2016). Sugar addiction: The state of the science. European Journal of Nutrition. Nov 55(Suppl 2):55-69. doi: 10.1007/s00394-016-1229-6. Epub 2016 Jul 2.

[20] World Health Organization (WHO). (2012). Global database on body mass Index Retrieved at: http://apps.who.int/bmi/index.jsp?introPage=_ intro_3.html.

[21] Worrells, P. (2016). Transfer of addiction and considerations for preventive measures in Bariatric Surgery, April 26.

[22] Yang, Q., Zhang, Z., & Gregg, E. (2014). Added sugar intake and cardiovascular diseases mortality among US adults. JAMA Intern Med.;174(4):516-524.