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Effects of Social Media Use and Dependence on
Dietary Intake and Prevalence of Orthorexia in
Pregnant and Non-Pregnant Women

By

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A thesis

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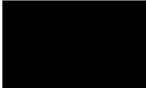
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Effects of Social Media Use and Dependence on Dietary Intake and Prevalence of Orthorexia in Pregnant and Non-Pregnant Women

Yara Issa

ABSTRACT

Social media use may have detrimental effects on the physical and mental wellbeing of young adults, including body image dissatisfaction and changes in dietary behavior. This issue may be of particular concern in pregnant women since adequate dietary behavior is essential for the health of the mother and fetus. The present study aimed to investigate the effects of social media use and dependence on dietary intake and prevalence of orthorexia nervosa in pregnant women and compare it to non-pregnant women. A mixed-method design was used. Participants (250 pregnant and 240 non-pregnant Lebanese women) filled a questionnaire assessing social media use and dependence, intuitive eating behaviors as well as orthorexia. Five focus groups (each including 10 pregnant women) were also conducted to supplement the quantitative data collected.

The prevalence of orthorexia was 21.6% in pregnant women compared to 12.9% in non-pregnant women ($p=0.011$). Social media use and dependence were negatively correlated with intuitive eating behaviors and practices. However, social media use was not significantly associated with orthorexia. Regression analyses showed that both social media use ($p<0.001$) and having a social media account ($p=0.023$) were predictors of reduced intuitive eating, with social media use being the most significant predictor. Data from the focus groups revealed that pregnant women felt that social media was negatively affecting their eating behavior, through an increase in appearance comparison as well as visual hunger. The latter was increased in the stressful context of the Lebanese economic collapse which reduced food accessibility, in addition to the COVID-19 pandemic-associated confinement which led to an increased use of social media as well as more unhealthy snacking. Social media use may negatively affect the dietary choices and intuitive eating behaviors of both pregnant and non-pregnant women. That being said, interventions to regulate social media content and limit exposure to unrealistic thin ideal as well as to educate women about dietary changes and requirements during pregnancy may be helpful to increase intuitive eating behaviors and decrease the risk of disordered eating and orthorexia in this population.

Keywords: Orthorexia Nervosa, Pregnant Women, Non-Pregnant Women, Social Media Use, Intuitive Eating, Eating Behavior, Lebanon.

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List of Abbreviations

| | |
|--------------|--|
| BMI | Body Mass Index |
| DE | Disordered Eating |
| ED | Eating Disorder |
| IE | Intuitive Eating |
| IES | Intuitive Eating Scale |
| IRB | Institutional Review Board |
| MTUAS | Media and Technology Usage and Attitudes Scale |
| ON | Orthorexia Nervosa |
| SMdep | Social Media Dependence |
| SMuse | Social Media Use |
| SPSS | Statistical Package for Social Sciences |

Chapter 1

Literature Review

1.1 Introduction

Proper nutrition and a varied well-balanced diet are essential in maintaining mental health and physical wellbeing. A major risk factor for depression and eating disorders across all age groups is an unhealthy diet (Strahler, 2020). Pregnancy is a “crucial period in life” at which women may be more susceptible to dietary behavior changes than usual (Anderson, 2001). Proper maternal nutrition is important for the well-being of the pregnant woman and her baby, whether before, during or after pregnancy (Wessells et al, 2019). Making the right food choices every day during pregnancy ensure that babies gain the proper amount of weight and get the nutrients that they need to develop. If healthy behaviors are not adopted, risks of adverse pregnancy outcomes increase, including low birth weight, pre-term birth, preeclampsia and others (Forbes et al, 2018). Thus, studying eating behaviors during pregnancy in particular is really important.

1.2 Eating Behavior during Pregnancy

Previous work has shown that pregnant women may become more motivated to eat a healthy diet compared to non-pregnant since they start to consider the impact of their diet on their baby’s health and well-being (Forbes et al, 2018). Despite the fact that most women know the importance of healthy eating during pregnancy, they may at the same time lack knowledge of certain dietary recommendations or may not have the proper skills

to enhance their diet (Reyes et al, 2013). Despite knowing that their baby benefits from healthy eating, pregnant women may feel that it is acceptable to consume unhealthy or processed foods because their body composition has been modified and weight gain is more “socially acceptable” (Kirsten et al., 2018). Thus, pregnancy might give women a reason or an excuse to have positive or negative changes in their diets. Adding to that, cravings, food aversions, nausea, vomiting and other barriers may also challenge women when trying to eat healthy during pregnancy. According to a study done by Forbes et al (2018) in Canada on 379 pregnant women, some changes that were implemented in the diet of pregnant women include increasing consumption of fruits and vegetables, grain and dairy products while on the other hand, decreasing or eliminating foods from the meats and alternatives group. They also reported changes in their beverage intake, as many decreased or eliminated alcoholic beverages, coffee and tea from their diet. In addition, they also mentioned that women who increased their intake of certain food items did so due to a craving, while they decreased their intake of other food items to promote the health of the baby. Results from this study indicate that women report decreasing ingestion of foods that could pose harm on their pregnancy, but do not increase their ingestion of foods that provide crucial macro and micronutrients required for a healthy pregnancy. Another study was conducted by Verbeke & Bourdeaudhuij (2007) in Belgium to compare the diets of non-pregnant and pregnant women. It included 158 pregnant and 130 non-pregnant women aged between 20 and 40 years. These women completed a self-administered questionnaire which included questions about their eating behavior and nutritional beliefs and attitudes. Pregnant women reported higher consumption of fruits, dairy and beef products and they reported lower use of alcohol and tobacco. However, they did not report a higher intake of cooked vegetables even though they reduced the

intake of raw vegetables for food safety purposes. In another study by Lundqvist et al (2014), dietary intake of pregnant women was different when compared to non-pregnant women as they had a lower intake of carbohydrates, meat/fish, vegetables and alcohol and a higher intake of supplements. To summarize, pregnant women do make changes to their diet, however, previous findings suggest that it is not a priority for them to have a nutrient-dense diet. This may lead to poor intake of nutrients that are essential for prenatal development, keeping in mind however that fear of posing harm on the baby is still an important issue that women consider when making these changes.

Intuitive eating (IE) is a dietary framework that pregnant women may benefit from adopting. According to Tribole & Resch (2012) and Cadena-Schlam & López-Guimerà (2015), IE is an “anti-diet” approach after failure of caloric-restricted diets. It is an adaptive form of eating that guides eating behaviors according to internal hunger and satiety cues, rather than external emotional drives or dieting guidelines. This approach aims at enhancing the mind-body connection and reinforcing body gratitude. It is also correlated with positive physical and psychological health outcomes. The concepts that make up the IE process include permission to eat while letting go of the dieting mentality, eating for physical cues instead of emotional reasons, and dependence on hunger and satiety cues while eating. According to Daundasekara et al (2017), intuitive eating has been associated with a lower BMI and a more stable weight alongside less food anxieties among non-pregnant adults. It even shows improved body image and weight maintenance as well as a better psychological health in overweight and obese non-pregnant women. These facts make intuitive eating an adaptive and healthy eating pattern among pregnant women as well since appropriate weight gain, improved body image and a good

psychological health are crucial parts for a healthy pregnancy (Paterson et al, 2018). To sum up, during pregnancy women may modify their intake for better or worse depending on the context and how they feel about themselves.

1.3 Effects of Social Media Use on Pregnancy

Social media use has been steadily increasing among young adults (Hruska & Maresova, 2020). According to Ramesh et al (2018), social media use is a “global consumer phenomenon” with an exponential rise within the past few years. Seventy percent of Americans use social media and connect with each other nowadays, compared to only five percent in 2005 and the numbers are still on the rise (Surani et al, 2017). As such, it is essential to better understand the effects that social media use and dependence might have on mental health and well-being.

Social media tends to represent what is marketed as preferable body shapes and appearances alongside the widespread trend of posting food pictures and videos, which may affect users’ body image, cravings and dietary choices (Klassen et al, 2018). Aparicio-Martinez et al (2019) confirmed that social media may lead to disordered eating behaviors since unrealistic beauty ideals are often popularized. They further stated that social media has been previously shown to have significant effects on body image, eating habits, and social comparison. Moreover, social media use has been associated with higher levels of depression in adults, as well as eating disorders (Carrotte, Vella & Lim, 2015).

According to Holland & Tiggemann (2016), viewing and posting photos and pursuing negative feedback via status updates, were identified as “problematic”. They also

confirmed that the role of social media is considerable in influencing individuals to change their eating habits, ending up with disordered eating behaviors. Furthermore, this is also supported by Mingoia et al (2017), a meta-analytic review assessing the relationship between social media use and the internalization of a thin ideal. They found that, since accessibility of social media is very easy nowadays, the use of social networking sites could be a socio-cultural predictor of body dissatisfaction that can lead to the early onset of eating disorders. To sum up, the use of social media can influence individuals, specifically females, to change their eating patterns which may lead to disordered eating behaviors and thus the onset of eating disorders.

Hicks & Brown (2016) found that a high number of pregnant women are concerned about gaining weight during pregnancy and about how their bodies will look like after delivery. They face a lot of social pressure not to gain weight, especially because of the increased use of social media. The authors also stated that pregnant women with negative thoughts about body image often follow unhealthy diets and eating patterns and deal with constant attempts to lose weight, which increase the risk of adverse pregnancy outcomes. Moreover, social media often portrays ideal images of pregnant women and focuses on how little weight many pregnant famous celebrities gain or on how fast they lose the weight after giving birth. In addition, Hicks & Brown (2016) found that over half of women frequently compare their pregnant body to others on Facebook and spending a lot of time browsing social media has been associated with body dissatisfaction, most probably because of the great opportunity for comparisons. Additionally, according to a study done by Liechty et al (2018) among pregnant and postpartum women, findings suggest that nearly 50% of the participants felt that social media impacted their body

image negatively as they compared their bodies to the images presented on social media and almost all participants felt that “media portrayals” should become more realistic and natural with less emphasis on women’s bodies and appearances. Moreover, in a study analyzing “health-related Facebook posts” from young pregnant women, Marshall et al (2020), suggested that young pregnant women frequently post about eating behaviors, exercise habits, and concerns around body image. Some women perceived weight gain as a positive indicator of their baby’s health while many others considered weight gain as a negative indicator and emphasized on the need to return to their weight before pregnancy and body shape postpartum. Facebook posts of young women presented “unfiltered insights” into their thoughts about health during pregnancy. The posts showed that young women, during pregnancy, frequently “frame their thoughts and feelings” regarding weight gain in the context of food cravings and body image. Klassen et al (2018) found that the chances of social media having a bad influence on dietary intake increase significantly when a person lacks knowledge about proper nutrition and how to achieve a healthy lifestyle. Moreover, it was noted that many people, who are not experts in the field of nutrition, spread various so-called facts or myths about food and dietary patterns that are not backed up by science. They further found that unrealistic images that are filtered or refined in a certain way can increase body image dissatisfaction especially among pregnant women. This in turn can affect the dietary intake of these women, who might potentially enter in a cycle of disordered eating and in worst case scenarios eating disorders, and thus affect the health of both, the mother and the baby. To summarize, high social media use among pregnant women might affect how they perceive their bodies, which may lead to the development of harmful eating behaviors.

1.4 Developing Eating Disorders during Pregnancy

Many pregnant women may become excessively focused on the types of foods that they eat in addition to how much weight they gain during their pregnancy. Some women may try to only eat organic foods, to stay away from genetically modified organisms, and to avoid processed foods fearing that it may harm their baby (Potera, 2016). However, obsessive thoughts, emotions and behaviors about eating only healthy foods can result in women isolating themselves from their friends and family, causing stress and anxiety and affecting their social life. Furthermore, the elimination of necessary nutrients and vitamins from the diet and restricting many food groups can affect their health negatively and cause damage. Numerous studies have been conducted to characterize the eating habits and dietary behaviors of pregnant women, including the prevalence of disordered eating (DE) and eating disorders (ED) in pregnancy. The difference between ED and DE is often the degree of severity and frequency of exhibiting symptoms, with the latter being both less severe and frequent (Bannatyne et al, 2018). While healthy eaters usually think of food, weight, and eating 10-15% of the day (Berg, 2001), studies show that people suffering from disordered eating think of food, eating, and weight 20 to 65% of the time or more (Anderson, 2020). DE in pregnancy has been associated with many adverse outcomes, including miscarriage, premature birth, low birth weight, high chances for caesarean section and other difficulties (Bannatyne et al, 2018).

While experiencing disturbances in eating patterns during pregnancy (such as increases or decreases in appetite, food cravings, inconsistent eating patterns and others) is normal, it might also mask disordered eating symptoms. Pregnancy can trigger or intensify existing negative feelings about the body (Hicks & Brown, 2016). According to

Claydon et al (2018), pregnant women might experience the feeling that they are in a body different from theirs, but a pregnant woman with an ED (or a history of an ED) might disconnect from her body to a much greater and more serious extent. Although she might realize that the changes in her body are important for the baby to grow, it is much harder for her to accept changes in her body shape and weight, which may increase physical and psychological tension during the pregnancy. To summarize, pregnant women who are at high risk of developing an ED or are suffering from an ED often develop harmful dietary behaviors that might negatively influence their pregnancy.

Orthorexia nervosa (ON) is described as an unhealthy obsession with healthy food (Parra-Fernández et al, 2018) and focuses on quality of foods rather than on their quantity (Andreas et al, 2018). Bratman mentioned orthorexia nervosa for the first time in 1997 to refer to a “fixation on eating proper food to achieve improved health” (Bratman, 1997). Cena et al (2019) stated that ON is a disordered eating behavior caused by the pursuit of an "extreme dietary purity" due to an exaggerated focus on food. This disordered eating behavior can lead to major negative outcomes such as food restrictions, emotional fluctuations and social withdrawal (Brytek Matera, 2012; Moroze et al, 2015). Its development can be explained as an active interaction of biological, psychological, and social dynamics over time (Douma et al, 2020). Orthorexic people become obsessed with the food they consume and tend to follow a very restrictive diet (Koven & Abry 2015). Thus, they are likely to experience several emotions depending on their adherence to their diet. For instance, they feel guilty when they cheat on their healthy diet and satisfied when they strictly follow it. However, although there are currently many research studies on

ON, there is no universally shared definition nor diagnostic criteria for ON at present (Cena et al, 2017; Rogoza & Donini, 2020).

The prevalence of ON in the general US population was estimated to be less than 1% (Dunn et al, 2016). Additionally, a recent study by Turner & Lefevre (2017) was done to assess social media effects on ON. The authors found that, among 680 females participants (from UK, US, and 40 other countries), the prevalence of ON was 49%, which is significantly higher than the general population (<1%). Their results show that Instagram use was associated with a high tendency towards orthorexia nervosa, highlighting the psychological impacts and the influence “social media celebrities” may have on thousands of individuals. They also emphasized on that these results may have “clinical implications” for ED development and recovery.

However, in a cross-sectional study done by Haddad et al (2019), out of 811 Lebanese males and females participants, 75.2% had ON tendencies and behaviors. Additionally, results showed that females had higher level of orthorexic behaviors (lower ORTHO-15 scores). They suggested that misleading advertisements on social media concerning healthy eating may affect eating and lead to unhealthy eating behaviors among the Lebanese population. Moreover, their findings suggest that, among the Lebanese population, the “awareness-raising” about healthy lifestyles and behaviors could be a factor contributing to the concerns about healthy eating patterns and behaviors and could promote preferences towards healthy foods and healthy eating. In another study assessing orthorexia in Poland and Lebanon by Brytek-Matera et al (2020), findings suggest that Lebanese adults were at a higher risk of developing ON and the difference was “driven by women”. This study included a Lebanese sample that consisted of 519

adults (283 women and 236 men) recruited randomly in community pharmacies. They found that prevalence of ON is higher in the Lebanese sample compared to the Polish one (8.4% versus 2.6%). Similarly, work by Strahler et al (2020) showed higher levels of ON among Lebanese adults comparing with German adults (8.4% versus 4.9%).

Chapter 2

Aim and Hypothesis

2.1 Gap in the Literature

Currently, studies assessing ON during pregnancy are quite limited and more research is needed. Moreover, the relationship between social media use and ON is unclear, although relationships between social media use and other eating disorders have been reported (Turner & Lefevre, 2017).

2.2 Research Aim and Objective

Given the high use of social media applications and the high risk associated with inappropriate dietary choices among pregnant women, the present study aimed to investigate the effects of social media use and dependence on dietary intake and prevalence of orthorexia nervosa in pregnant women and compare it to non-pregnant in the Lebanese population.

Chapter 3

Materials and Methods

3.1 Study Design

This study is an observational case-control study conducted to examine the effects of social media use and dependence on dietary intake and prevalence of orthorexia in pregnant vs. non-pregnant Lebanese women.

3.2 Study Participants

Participants were non-pregnant women (control) and pregnant women aged between 19 and 46 years old. They were recruited from across all Lebanon. In total, 490 women participated in the study, of which 250 were pregnant and 240 were not pregnant. The major criterion for exclusion is illiteracy since data collection required a questionnaire to be filled.

3.3 Data Collection and Procedure

The proposed study included two cross sectional surveys, one specific for pregnancy and the other for the non-pregnant. It also included focus groups of pregnant women. This study was approved by the Institutional Review Board (IRB) at the Lebanese American University. At the beginning of each survey, written informed consent was present to ensure anonymity and confidentiality of all women involved.

Data collection of the present study was survey-based. The second part of the data collection was focus groups to be able to supplement and assess the information quantitatively. 250 pregnant women filled a 15-20 minute pregnancy-specific questionnaire and were recruited mainly from local gynecologists' clinics. Another questionnaire designed for non-pregnant was filled by 240 women. Emails were also sent to them since an online version of the survey was also available.

3.4 Surveys

The online survey was developed using Survey Monkey. Each survey began with an informed consent and included four sections as described below.

3.4.1 Demographics

This section enquires about age, current weight, area of residence, level of education, intake of any supplements, and whether they have any social media accounts. In addition, the version for pregnant women includes items about weight before pregnancy, weeks of pregnancy, whether or not it was their first pregnancy.

3.4.2 Eating Behaviors

Eating behaviors are measured through the Intuitive Eating Scale (IES) for pregnant women validated in Texas by Daundasekara et al (2017). The IES evaluates three constructs considered to make up intuitive eating. These constructs include unconditional permission to eat (ex: "I tried to avoid certain foods high in fat, carbohydrates, or

calories”), eating on a physical basis rather than emotional basis (ex: “I usually stopped eating when I felt full and not overstuffed”), and finally dependence on satiety and hunger cues to decide the time and the quantity of food to be eaten (ex: “I could tell when I was slightly full”). Participants are asked, based on a 5-point Likert scale (1 strongly disagree and 5 strongly agree), 15 questions related to their eating behaviors when they are emotional, bored, mad, lonely, stressed out, and about their feelings of fullness/hunger. A number of the scale items are positively stated and others are negatively stated. While calculating the scores, the negative items are reversely scored ensuring that higher scores indicate greater intuitive eating. Then, to obtain subscale scores, the scores of items under each subscale are summed. The total IES score is the sum of three subscale scores. The total subscale score is divided by the number of items in each subscale to get the mean subscale scores. This will result in scores ranging from 1 to 5.

3.4.3 Social Media Use and Dependence

Social media use and dependence is measured through subscales of the Media and Technology Usage and Attitudes Scale (MTUAS; Rosen et al., 2013) validated in Lebanon by Zeeni et al (2018). The MTUAS originally included 11 media and technology usage subscales: “smartphone usage, general social media usage, e-mailing, media sharing, Internet searching, text messaging, video gaming, online friendships, phone calling, and watching television”. In addition to that, the scale includes four attitude subscales: positive attitudes, negative attitudes, technological anxiety/dependence, and attitudes toward task-switching. The technology usage-related items are rated on a 10-point Likert scale ranging from 1 (‘never’) to 10 (‘all the time’). The attitudes-related items are rated on a 5-point

Likert scale ranging from 1 ('strongly disagree') to 10 ('strongly agree'). An example of an item for social media dependence is "I get anxious when I don't have my cell phone". The social media usage, online friendships and social media anxiety and dependence subscales were used.

3.4.4 Orthorexia Nervosa

Orthorexia nervosa is assessed through a quantitative tool adapted from the ORTO-15 test validated at the Institute of Food Sciences, University of Rome "La Sapienza" by Donnini et al (2005). The ORTO-15 tool consisting of 15 questions that describe the orthorexic behavior intensification. Each question is assessed by using the 4 Likert scale (always, often, sometimes, never). The higher the score of the response (1 to 4), the better the eating pattern and behavior. Taking the orthorexia symptoms list of Steven Bratman into consideration, questions were designed to meet the emotional and cognitive aspects related to the orthorexia symptoms (6 items) and eating behavior. The cutoff point is at the score of 40 points (total score < 40, no orthorexia; total score \geq 40, orthorexia). The ORTO-15 is a valid and reliable tool widely used in many countries (Roncero et al, 2017). It was also used multiple times in Lebanon (Haddad et al (2019); Farchakh et al (2019)) and recently, Haddad et al (2020) developed an Arabic version of this instrument and confirmed its reliability and validity in the Lebanese population.

3.5 Focus Groups

After completing of the surveys, pregnant women participated in focus group sessions. The purpose of these sessions was to supplement the collected data. Five focus groups were conducted, including ten pregnant women each. The sessions lasted 45 minutes each and were lead by the research team. To guide the discussion, an interview guide consisting of six questions was developed. The questions were open-ended to make sure that the group was engaged and lead the discussion, instead of the moderator. The purpose of this process was to better understand the effects of social media on dietary intake of pregnant women and the challenges encountered during their pregnancy, including the economic crisis in Lebanon as well as the Covid-19 pandemic.

The key questions were:

- 1- What do you think are the pros and cons of social media?
- 2- In your opinion, how can social media affect dietary intake?
- 3- What are your thoughts about orthorexia nervosa? Do you think it is a serious condition?
- 4- As a pregnant woman, what are the main challenges that you are facing right now during the current economic crisis in Lebanon?
- 5- How is this economic crisis affecting you dietary intake?
- 6- Did the pandemic (Covid-19) impact your pregnancy and dietary intake? How?

Two focus groups were conducted online via Zoom Meetings, while the other three groups were conducted in a conference room. The moderator recorded opinions, comments, and statements from the interviewed pregnant women. The discussions were recorded as a way of capturing feedback.

3.6 Statistical Analysis

Data was analyzed using the Statistical Package for Social Sciences (SPSS 25). Descriptive data are presented as mean \pm standard deviation (SD). Independent samples t-tests were performed for comparisons of group means for normally distributed variables. Chi-square tests were used to compare categorical variables. Statistical significance was set as $P < 0.05$. To further analyze the results and identify the predictors of orthorexia, multiple linear regressions were conducted.

Chapter 4

Results

The study sample included 490 women of which 250 (51%) were pregnant and 240 (49%) were not pregnant.

4.1 Demographics

All participants who had completed the survey were included in the analysis (n pregnant= 250; n non-pregnant = 240). The participants were aged between 19 and 46 years. The control group (non-pregnant) mean age was 28.62 ± 6.48 years, whereas pregnant had a mean age of 30.5 ± 4.42 years ($p= 0.000$) (table 1). Total Intuitive Eating Score (IES) was 3.3 ± 0.46 for the cases and 3.18 ± 0.37 for the controls ($p=0.001$). Moreover, social media use scores (SMuse) and social media dependence scores (SMdep) were significantly different between the cases and controls. Also, pregnant women had a significantly higher orthorexia score (35.5 ± 4.94) compared to non-pregnant (33.6 ± 4.84) ($p=0.000$).

Table 1 Demographic characteristics of pregnant women vs control group (non=pregnant) based on continuous variables

| | Non-Pregnant | | Pregnant | | T-test | P-value |
|---|--------------|--------------------|----------|--------------------|--------|---------------|
| | Mean | Standard Deviation | Mean | Standard Deviation | | |
| Age | 28.62 | 6.48 | 30.50 | 4.42 | 3.770 | 0.000* |
| Body Mass Index (BMI, kg/m ²) | 24.06 | 4.58 | 23.40 | 3.74 | -1.749 | 0.081 |
| Total Intuitive Eating Scale Score | 3.18 | 0.37 | 3.30 | 0.46 | 3.333 | 0.001* |
| Social Media Use | 54.85 | 13.58 | 45.71 | 16.51 | -6.667 | 0.000* |
| Social Media Dependence | 11.05 | 3.17 | 10.18 | 4.07 | -2.634 | 0.009* |
| ORTO 15 Score | 33.63 | 4.84 | 35.50 | 4.94 | 4.229 | 0.000* |

* Statistically significant (P<0.05)

4.2 Characteristics of Pregnant Women Compared to Non-Pregnant

Table 2 shows the participants characteristics. Pre-pregnancy weight was used to calculate the body mass index (BMI = weight in kg/height in m²) for the pregnant group. Results showed that 67.6 % of pregnant were in the healthy BMI range compared to 52.5 % of non-pregnant, 6.4 % of pregnant were underweight compared to 10 % non-pregnant , 19.6 % of pregnant were overweight compared to 28.3 % non-pregnant , and 6.4 % of pregnant were obese compared to 9.2 % non-pregnant (Chi-square= 11.701, p=0.008). Regarding education level, 78.4 % of pregnant women had a BS degree or above compared to 46.7 % of non-pregnant, and 4.4 % of pregnant completed 9th grade or below compared to 10 % of non-pregnant (Chi-square = 52.869, p= 0.001). As for social media, the majority of pregnant and non-pregnant had social media accounts with 94.4 % and 98.8 % , respectively (Chi-square= 6.919, p=0.009). Finally, orthorexia was present in

21.6% of pregnant women compared to 12.9 % of non-pregnant (Chi-square= 6.439, p=0.01).

Table 2 Characteristics of pregnant women vs control group (non=pregnant) based on categorical variables

| | | Non-Pregnant | | Pregnant | | Chi-Square | P-value |
|---|--------------------|--------------|------------|----------|------------|------------|---------------|
| | | Count | Column N % | Count | Column N % | | |
| Body Mass Index (BMI, kg/m ²) | Underweight | 24 | 10.0% | 16 | 6.4% | 11.701 | 0.008* |
| | Healthy | 126 | 52.5% | 169 | 67.6% | | |
| | Overweight | 68 | 28.3% | 49 | 19.6% | | |
| | Obese | 22 | 9.2% | 16 | 6.4% | | |
| Education Level | 9th grade or below | 24 | 10.0% | 11 | 4.4% | 52.869 | 0.001* |
| | High school | 104 | 43.3% | 43 | 17.2% | | |
| | BS degree or above | 112 | 46.7% | 196 | 78.4% | | |
| Social Media Account | Yes | 237 | 98.8% | 236 | 94.4% | 6.919** | 0.009* |
| | No | 3 | 1.3% | 14 | 5.6% | | |
| Orthorexia | No | 209 | 87.1% | 196 | 78.4% | 6.439 | 0.011* |
| | Yes | 31 | 12.9% | 54 | 21.6% | | |

* Statistically significant (P<0.05)

** Result of Fisher test

4.3 Correlations

To analyze the results, Pearson correlation tests were conducted to examine the relationship between social media use/dependence, intuitive eating, and orthorexia. Results suggest that both social media use and social media dependence were negatively

correlated with the total IES score ($r = -0.186, p = 0.000$; $r = -0.103, p = 0.022$), respectively. This result indicates that as social media use and dependence increase, total IES score decreases. No significant correlation was found between social media use/dependence and orthorexia (table 3).

Table 3 Correlations between social media use/dependence, intuitive eating behavior, and orthorexia.

| | | Intuitive Eating Scale Score | Orthorexia Score |
|--------------------------------|---------------------|------------------------------|------------------|
| Social Media Use | Pearson Correlation | -0.186 | -0.068 |
| | P-value | 0.000* | 0.136 |
| | N | 490 | 490 |
| Social Media Dependence | Pearson Correlation | -0.103 | -0.031 |
| | P-value | 0.022* | 0.488 |
| | N | 490 | 490 |

* Statistically significant ($P < 0.05$)

4.4 Multivariate Analysis

A multiple linear regression analysis was conducted to evaluate how well social media use and dependence influence eating behavior among pregnant and non-pregnant women. The coefficient table (table 4) shows the predictors of intuitive eating behavior. Results suggest that both social media use ($p = 0.000$) and social media account ($p = 0.023$) are significant predictors of intuitive eating behavior. Social media use with a standardized coefficient of 0.237 is a more significant predictor than social media account with a standardized coefficient of 0.133. Social media dependence was significantly correlated with intuitive eating behavior before the model, however it lost significance after. In

addition, social media account was found to be a new significant variable, negatively correlated with intuitive eating.

Table 4 Multiple Linear Regression Model to determine predictors of intuitive eating behavior

| Coefficients – Dependent Variable: Intuitive Eating Scale Score | | | | | |
|--|------------------------------------|-------------------|----------------------------------|----------|-------------|
| Model | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
| | B | Std. Error | Beta | | |
| (Constant) | 3.732 | .290 | | 12.881 | .000 |
| Age | .001 | .003 | .012 | .263 | .793 |
| Body Mass Index | .002 | .004 | .018 | .398 | .691 |
| Education Level | .039 | .031 | .058 | 1.269 | .205 |
| Social Media Account | -.313 | .137 | -.133 | -2.287 | .023* |
| Social Media Use | -.006 | .002 | -.237 | -3.986 | .000* |
| Social Media Dependence | -.005 | .007 | -.046 | -.810 | .418 |

* Statistically significant (P<0.05)

4.5 Focus Groups

All pregnant women agreed that social media is affecting their eating behavior and dietary intake whether directly or indirectly. Most of them agreed that the most important advantage of social media is connectivity, and that the disadvantages outweigh the advantages. A number of pregnant women mentioned that one of the disadvantages of social media is its effect on dietary intake. It can be harmful to the mental health especially because it subconsciously affects food choices and leads people towards adopting

unhealthy eating behaviors. Therefore, social media could *directly* affect dietary choices by simple exposure to appealing food images and sponsors that are usually unhealthy processed foods, or *indirectly* by exposure to influential visual material including visuals that may promote the thin ideal, and therefore leading to self-comparison and body image concerns. There was a consensus about the fact that orthorexia is a serious condition that could lead to psychological, psychosocial, and physiological impairments in extreme cases.

Regarding the economic crisis today in Lebanon, most of the participants mentioned that the increases in food costs are leading to changes in the quantity and type of food choices that are being purchased. This may result in the substitution of expensive food choices for cheaper options that are often less nutritious and/or the reduction of quantity of food consumed in general. Some of the participants emphasized on the fact that people with high socio-economic status (having a higher income) are more likely to have healthier food choices and a variety of options, whereas people with low socio-economic status (that are a major proportion in Lebanon today) have less than optimal diet patterns and less consistent and varied food choices, which contributes to poor health status and higher rates of illness.

Furthermore, the major impacts and challenges that affected pregnant women during the current Covid-19 pandemic were (1) disrupted lifestyle due to lockdown and lack of accessibility to supermarkets and food stores, (2) lack of availability of all food choices due to the increased demand and consumption, (3) increased use of social media combined with increased unhealthy snacking frequency, both due to the lockdown and quarantine, as well as (4) increased stress and anxiety that influenced food habits during lockdown.

Chapter 5

Discussion

The present study aimed to investigate the effects of social media use and dependence on dietary intake and prevalence of orthorexia nervosa in pregnant women and compare it to non-pregnant women in the Lebanese population. Results showed that 21.6% of pregnant women had orthorexia compared to 12.9% of non-pregnant women. Previous work (Forbes et al, 2018; Verbeke & De Bourdeaudhuij, 2007) showed that pregnant women are more aware and conscious about their diets, and their food choices are driven by safety concerns during their pregnancy. In other words, pregnant women may become more motivated to eat a healthy diet compared to non-pregnant women since they consider the impact of their diet on their baby's health and well-being. However, they may also lack knowledge of certain dietary recommendations, tend to over-restrict their intake, or may not have the proper skills to enhance their diet and thus end up having disordered eating that could lead to eating disorders, including orthorexia (Reyes et al, 2013).

Contrarily to findings by Turner and Lefevre (2017) indicating a positive association between social media use (specifically Instagram) and risk of ON symptoms, the present study found no significant correlation between the latter two variables. This finding is also reflected in previous studies, where results were conflicting. Although relationships between social media use and other eating disorders have been reported, there is limited literature that has explored social media and ON risk during pregnancy (Turner & Lefevre, 2017). Findings by Klassen et al (2018) and Nana & Zema (2018)

revealed that the chances of social media having a bad influence on eating behavior increase significantly when a person lacks knowledge and education about proper nutrition and how to achieve a healthy dietary pattern and lifestyle. In the present study, the majority of the sample was highly educated which could be considered as a potential protective factor against ON risk.

The present study found a negative correlation between social media use and dependence and intuitive eating behavior in both pregnant and non-pregnant women. In other words, as social media use increases, intuitive eating behaviors and practices decrease. These results are evident in the agreement between findings of Zemlyanskaya et al (2022) and Turner & Lefevre (2017) that found that heavier social media use increases the risk of adopting unhealthy eating behaviors. There are several factors that could contribute to this negative association between social media use and intuitive eating behavior. First, the “image-focused” nature of social media which makes social media platforms ideal for sharing food images, and thus people exposed to these images would be indirectly influenced by the messages these platforms convey about food (Turner and Lefevre, 2017). In fact, Hawkins et al (2020) work showed that exposure to social media platforms and social norm messages conveying the typical eating behavior of others has influenced people’s own consumption of food and thus their eating behavior. Second, social media encourages selective exposure whereby women can choose which accounts they wish to follow. In our study, results showed that the majority of pregnant women browse cooking accounts, influencer/fashionista accounts, celebrities and motivational accounts. This selective exposure may lead to women believing that a behavior is more prevalent than is actually the case and thus could lead to “perceived social pressures to

conform to such behaviors” (Turner & Lefevre 2017)). Moreover, users perceived as “influencers” or “celebrities” can influence a large number of people by showing them a constant feed of unrealistic images portraying a certain healthy diet or behavior.

Regression analyses showed that both social media use and having a social media account were predictors of reduced intuitive eating, with social media use being the most significant predictor, in both pregnant and non-pregnant women. Rounsefell et al (2020) found that exposure to idyllic images (celebrities, peers, fitness) was associated with higher body image dissatisfaction, dieting/restricting food, and unhealthy eating behavior among women. In other words, the use of social networking sites could be a socio-cultural predictor of body dissatisfaction that can in turn lead to unhealthy eating practices and early onset of eating disorders (Mingoia et al, 2017). Indeed, findings from Izydorczyk et al (2020), showed that the socio-cultural standard of body image promoted by mass media is a predictor of the development of unhealthy and restrictive behavior toward eating and the risk of eating disorders in women. Therefore, the use of social media can influence women to change their eating patterns which may lead to disordered eating behaviors.

Data from the focus groups revealed that pregnant women felt that social media was negatively affecting their eating behavior, through an increase in appearance comparison as well as visual hunger. The latter was increased in the stressful context of the Lebanese economic collapse which reduced food accessibility, in addition to the COVID-19 pandemic-associated confinement which led to an increased use of social media as well as more unhealthy snacking. According to a study done by Ceulemans et al (2020) to assess the impact of the COVID-19 pandemic in pregnant and breastfeeding

women in primary care in Belgium, it was shown that women's medical counseling and social support were negatively affected by the lockdown. This might have affected their mental health, and consequently their dietary intake and eating behaviors. Similarly, high levels of depressive symptoms and generalized anxiety were seen among pregnant and breastfeeding women during the COVID-19 outbreak (Ceulemans et al, 2021). Moreover, it was shown that fear of COVID-19 infection may increase anxiety over food quality and quantity and consequently impact eating behavior (Nutley et al., 2021). Specifically, Rodgers et al (2020) found a positive association between fear of COVID-19, eating restraint, and concerns related to weight or shape or body image. Furthermore, the recent Lebanese economic crisis lead to increases in food costs may have impacted the quantity and quality of food purchases. Therefore, pregnant women and specifically with low socio-economic status have unhealthy diet patterns, disordered eating, and less consistent and varied food choices, which contributes to poor health status and leads to higher rates of eating disorders. This is also supported by Norte et al (2019) who emphasized the fact that economic crises increase obesity risk, poor diet and eating disorder risks. To sum up, data from the focus groups showed that social media use was indeed affecting pregnant women's dietary intake and eating behaviors. This impact was exacerbated by the major challenges that women were facing during their pregnancy, namely the Covid-19 pandemic and the Lebanese economic crisis. These events disrupted the women's lifestyle due to lack of accessibility and availability of various food choices, increased social media use along with increased unhealthy snacking, and increased stress and anxiety. Thus, these two emergencies are confounding factors indirectly affecting pregnant women's dietary intake and eating behaviors.

A number of limitations need to be acknowledged. First, it is important to underline the fact that the participants used self-administered questionnaires, which may have influenced the objectivity of certain answers, such as self-reported height and weight. Furthermore, the generalizability of the study is limited since the sample consisted of Lebanese women only. Another limitation is that the research on ON in Lebanon is limited, therefore the data used for comparison of studies is quite poor. Finally, the majority of the women were highly educated which could also be considered a bias.

Concerning the strengths of the current study, the most important one to note is the fact that it is the first to assess the prevalence of ON in Lebanese pregnant women. Moreover, the use of focus groups helped us to expand on the objective data collected and identify the effects of social media on dietary intake of pregnant women and the challenges encountered during their pregnancy, taking into consideration the economic crisis in Lebanon as well as the Covid-19 pandemic.

Chapter 6

Conclusion

It is known that proper maternal nutrition is essential for the well-being of pregnant women and their babies, however, findings from the present study emphasize that social media use may negatively affect the dietary choices and intuitive eating behaviors of both pregnant and non-pregnant women. This study aimed at examining how dietary behaviors, social media, and orthorexia are interrelated. It was found that social media use is not correlated with orthorexia. However, social media use and dependence plays a major role in dietary choices and intuitive eating among the participants.

Future studies are needed to further investigate the reasons behind the presence of this eating disorder among pregnant women and whether it develops before or during pregnancy. That being said, interventions to regulate social media content to limit the exposure to unrealistic thin ideal as well as to educate women about dietary changes and requirements during pregnancy may be helpful to increase intuitive eating behaviors and decrease the risk of disordered eating and orthorexia. Moreover, training healthcare team members to encourage a more intuitive eating approach and address body image issues during pregnancy may positively influence pregnant women's eating behaviors and overall health.

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Conflict of interest

The authors declare that there are no conflicts of interest.

Ethical Information

This study was approved by the Institutional Review Board of the Lebanese American University. Written informed consent was obtained from all participants before they were enrolled in the study.

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Appendix 1 – Pregnant Survey

Volunteer #:

Date:

If you would like to take part of this research project, you will be asked to complete a short questionnaire.

The information you provide will be used to assess the relationship between social media use and body image among pregnant and non-pregnant Lebanese women, as well as the prevalence of Orthorexia Nervosa (ON) – ON is an eating disorder characterized by an almost pathological addiction and obsession for healthy eating by which the patient focuses obsessively on “healthy” foods and avoids “unhealthy” ones, is always mentally preoccupied with what to eat quality-wise, and has very strict rules regarding dietary intake with violations causing extreme emotional distress.

*You will be asked to fill in one survey. It comprises of three sections: **Eating Behavior, Social Media Use and Dependence and Nutrition Beliefs.***

*The information provided by you in this questionnaire will be used for research purposes. Your answers will not be released to anyone and your identity will remain anonymous. Your name will not be written on the questionnaire or be kept in any other records. All responses you provide for this study will remain confidential. **When the results of the study are reported, you will not be identified by name or any other information that could be used to infer your identity.** Only researchers will have access to view any data collected during this research. Your participation is voluntary and you may withdraw from this research any time you wish or skip any question you don't feel like answering. Your refusal to participate will not result in any penalty or loss of benefits to which you are otherwise entitled to.*

The research intends to abide by all commonly acknowledged ethical codes. You agree to participate in this research project by filling the following questionnaire. If you have any questions, please ask the research team listed at the beginning of this questionnaire. Thank you for your time.

If you have any questions, or if answering these questions is causing you distress, and/or would like to receive nutritional counseling, please do not hesitate to contact:

| <i>Name</i> | <i>Phone Number</i> | <i>Email Address</i> |
|-------------------------|---------------------------------|--------------------------------|
| <i>Dr. Nadine Zeeni</i> | <i>+961 1 786456 ext.: 2317</i> | <i>nadine.zeeni@lau.edu.lb</i> |

If you have any question about your rights as a participant in this study, or you want to talk to someone outside the research, please contact the:

IRB Office, Lebanese American University

3rd floor, Dorm A, Byblos Campus; Tel: 00961 1 786456 (ext. 2546)

I- Demographics:

- 1- Age: _____ years
- 2- Height: _____ cm
- 3- Weight before pregnancy: _____ kg
- 4- Current weight: _____ kg
- 5- Weeks of pregnancy: _____ weeks
- 6- Is this your first pregnancy?
 - Yes
 - No
- 7- What is your area of residence?

-
- 8- What is your highest achieved education?
 - No schooling completed
 - 9th grade or below
 - High school certificate or its equivalent
 - Bachelor's degree or above

- 9- Do you take any supplements?
 - Yes
 - No

- 10- If your answer to the above question was Yes, specify the supplements that you take.
-

11- Do you have a social media account?

- Yes
- No

12- If your answer to the above question was Yes, which social media account do you have?

- Instagram
- Facebook
- Snapchat
- Twitter
- Other(s): _____

II- Eating Behavior:

| | Strongly disagree | Disagree | Neutral | Agree | Strongly agree |
|---|-------------------|----------|---------|-------|----------------|
| 1- I find myself eating when I feel emotional, even if I am not physically hungry | | | | | |
| 2- I find myself eating when I am bored, even if I am not physically hungry | | | | | |
| 3- I can tell when I am slightly full | | | | | |
| 4- I can tell when I am slightly hungry | | | | | |
| 5- I would get mad at myself for eating something unhealthy | | | | | |
| 6- I find myself eating when I am lonely, even if I am not physically hungry | | | | | |
| 7- I trust my body to tell me when to eat | | | | | |
| 8- I trust my body to tell me what to eat | | | | | |
| 9- I trust my body to tell me how much to eat | | | | | |
| 10- When I eat, I can tell when I am getting full | | | | | |
| 11- I use food to help me soothe my negative emotions | | | | | |

| | | | | | |
|---|--|--|--|--|--|
| 12- I find myself eating when I am stressed out, even if I am not physically hungry | | | | | |
| 13- I feel guilty if I eat a certain food that is high in calories, fat or carbohydrates | | | | | |
| 14- I don't trust myself around fattening foods | | | | | |
| 15- I don't keep certain foods at home because I think that I would lose control and eat them | | | | | |

III- Social Media Use and Dependence:

| How many times do you... | Never | Once a month | Several times a month | Once a week | Several times a week | Once a day | Several times a day | Once an hour | All the time |
|--|-------|--------------|-----------------------|-------------|----------------------|------------|---------------------|--------------|--------------|
| 1- Check your social network page | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 2- Check your social network page from your smartphone | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 3- Check social media at work or university | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 4- Post status updates | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 5- Post photos | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 6- Browse profiles and photos | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 7- Read postings | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 8- Comment on postings, status updates, photos, etc. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 9- Click like to a posting, photo, etc. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|---|

| | Strongly disagree | Disagree | Neutral | Agree | Strongly agree |
|--|-------------------|----------|---------|-------|----------------|
| 10- I get anxious when I don't have my cell phone | | | | | |
| 11- I get anxious when I don't have the internet available to me | | | | | |
| 12- I am dependent on my technology | | | | | |

13- What types of accounts do you mostly interact with? (*Choose all that apply*)

- Personal accounts (family, friends...)
- Celebrity accounts
- Fashionistas accounts
- Brand accounts
- Motivational accounts (ex: for weight loss and healthy lifestyle...)
- Cooking accounts
- Other(s): _____

IV- Nutrition Beliefs:

| | Always | Often | Sometimes | Never |
|--|--------|-------|-----------|-------|
| When eating, do you pay attention to the calories in the food? | | | | |
| When you go in a food shop, do you feel confused? | | | | |
| In the last 3 months, did the thought of food worry you? | | | | |
| Are your eating choices conditioned by your worry about your health status? | | | | |
| Is the taste of food more important than the quality when you evaluate food? | | | | |
| Are you willing to spend more money to have healthier food? | | | | |
| Does the thought about food worry you for more than 3 hours a day? | | | | |

| | | | | |
|---|--|--|--|--|
| Do you allow yourself any eating transgressions? | | | | |
| Do you think your mood affects your eating behavior? | | | | |
| Do you think that the conviction to eat only healthy food increases self-esteem? | | | | |
| Do you think that eating healthy food changes your life-style (frequency of eating out, friends...) | | | | |
| Do you think that consuming healthy food may improve your appearance? | | | | |
| Do you feel guilty when transgressing? | | | | |
| Do you think that on the market there is also unhealthy food? | | | | |
| At present, are you alone when having meals? | | | | |

We personally want to thank you for every second invested in our research. You are a great help! Think we were going to let you leave empty-handed?

We are going to have some focus groups (online meetings) for pregnant women to further discuss this topic, in which we will be answering your questions and providing free individualized nutrition education and diet consultations.

If you are interested and like to join, kindly provide us with an active phone number or email address on which we can contact you:

Appendix 2 – Non-Pregnant Survey

Volunteer #:

Date:

If you would like to take part of this research project, you will be asked to complete a short questionnaire.

The information you provide will be used to assess the relationship between social media use and body image among pregnant and non-pregnant Lebanese women, as well as the prevalence of Orthorexia Nervosa (ON) – ON is an eating disorder characterized by an almost pathological addiction and obsession for healthy eating by which the patient focuses obsessively on “healthy” foods and avoids “unhealthy” ones, is always mentally preoccupied with what to eat quality-wise, and has very strict rules regarding dietary intake with violations causing extreme emotional distress.

*You will be asked to fill in one survey. It comprises of three sections: **Eating Behavior, Social Media Use and Dependence and Nutrition Beliefs.***

*The information provided by you in this questionnaire will be used for research purposes. Your answers will not be released to anyone and your identity will remain anonymous. Your name will not be written on the questionnaire or be kept in any other records. All responses you provide for this study will remain confidential. **When the results of the study are reported, you will not be identified by name or any other information that could be used to infer your identity.** Only researchers will have access to view any data collected during this research. Your participation is voluntary and you may withdraw from this research any time you wish or skip any question you don't feel like answering. Your refusal to participate will not result in any penalty or loss of benefits to which you are otherwise entitled to.*

The research intends to abide by all commonly acknowledged ethical codes. You agree to participate in this research project by filling the following questionnaire. If you have any questions, please ask the research team listed at the beginning of this questionnaire. Thank you for your time.

If you have any questions, or if answering these questions is causing you distress, and/or would like to receive nutritional counseling, please do not hesitate to contact:

| <i>Name</i> | <i>Phone Number</i> | <i>Email Address</i> |
|-------------------------|---------------------------------|--------------------------------|
| <i>Dr. Nadine Zeeni</i> | <i>+961 1 786456 ext.: 2317</i> | <i>nadine.zeeni@lau.edu.lb</i> |

If you have any question about your rights as a participant in this study, or you want to talk to someone outside the research, please contact the:

IRB Office, Lebanese American University

3rd floor, Dorm A, Byblos Campus; Tel: 00961 1 786456 (ext. 2546)

I- Demographics:

1- Age: _____ years

2- Height: _____ cm

3- Weight: _____ kg

4- What is your area of residence?

5- What is your highest achieved education?

- No schooling completed
- 9th grade or below
- High school certificate or its equivalent
- Bachelor's degree or above

6- Do you take any supplements?

- Yes
- No

7- If your answer to the above question was Yes, specify the supplements that you take.

8- Do you have a social media account?

- Yes
- No

9- If your answer to the above question was Yes, which social media account do you have?

- Instagram

- Facebook
- Snapchat
- Twitter
- Other(s): _____

II- Eating Behavior:

| | Strongly disagree | Disagree | Neutral | Agree | Strongly agree |
|---|-------------------|----------|---------|-------|----------------|
| 1- I find myself eating when I feel emotional, even if I am not physically hungry | | | | | |
| 2- I find myself eating when I am bored, even if I am not physically hungry | | | | | |
| 3- I can tell when I am slightly full | | | | | |
| 4- I can tell when I am slightly hungry | | | | | |
| 5- I would get mad at myself for eating something unhealthy | | | | | |
| 6- I find myself eating when I am lonely, even if I am not physically hungry | | | | | |
| 7- I trust my body to tell me when to eat | | | | | |
| 8- I trust my body to tell me what to eat | | | | | |
| 9- I trust my body to tell me how much to eat | | | | | |
| 10- When I eat, I can tell when I am getting full | | | | | |
| 11- I use food to help me soothe my negative emotions | | | | | |
| 12- I find myself eating when I am stressed out, even if I am not physically hungry | | | | | |
| 13- I feel guilty if I eat a certain food that is high in calories, fat or carbohydrates | | | | | |
| 14- I don't trust myself around fattening foods | | | | | |
| 15- I don't keep certain foods at home because I think that I would lose control and eat them | | | | | |

III- Social Media Use and Dependence:

| How many times do you... | Never | Once a month | Several times a month | Once a week | Several times a week | Once a day | Several times a day | Once an hour | All the time |
|--|-------|--------------|-----------------------|-------------|----------------------|------------|---------------------|--------------|--------------|
| 1- Check your social network page | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 2- Check your social network page from your smartphone | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 3-Check social media at work or university | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 4- Post status updates | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 5- Post photos | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 6-Browse profiles and photos | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 7-Read postings | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 8-Comment on postings, status updates, photos, etc. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 9- Click like to a posting, photo, etc. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |

| | Strongly disagree | Disagree | Neutral | Agree | Strongly agree |
|--|-------------------|----------|---------|-------|----------------|
| 10- I get anxious when I don't have my cell phone | | | | | |
| 11- I get anxious when I don't have the internet available to me | | | | | |
| 12- I am dependent on my technology | | | | | |

13- What types of accounts do you mostly interact with? (*Choose all that apply*)

- Personal accounts (family, friends...)
- Celebrity accounts
- Fashionistas accounts
- Brand accounts
- Motivational accounts (ex: for weight loss and healthy lifestyle...)
- Cooking accounts
- Other(s):

IV- Nutrition Beliefs:

| | Always | Often | Sometimes | Never |
|---|--------|-------|-----------|-------|
| When eating, do you pay attention to the calories in the food? | | | | |
| When you go in a food shop, do you feel confused? | | | | |
| In the last 3 months, did the thought of food worry you? | | | | |
| Are your eating choices conditioned by your worry about your health status? | | | | |
| Is the taste of food more important than the quality when you evaluate food? | | | | |
| Are you willing to spend more money to have healthier food? | | | | |
| Does the thought about food worry you for more than 3 hours a day? | | | | |
| Do you allow yourself any eating transgressions? | | | | |
| Do you think your mood affects your eating behavior? | | | | |
| Do you think that the conviction to eat only healthy food increases self-esteem? | | | | |
| Do you think that eating healthy food changes your life-style (frequency of eating out, friends...) | | | | |
| Do you think that consuming healthy food may improve your appearance? | | | | |
| Do you feel guilty when transgressing? | | | | |
| Do you think that on the market there is also unhealthy food? | | | | |
| At present, are you alone when having meals? | | | | |

NOTICE OF IRB APPROVAL

To: Dr. Nadine Zeeni
 Associate Professor
 School of Arts & Sciences

APPROVAL ISSUED: 3 November 2020
EXPIRATION DATE: 3 November 2021
REVIEW TYPE: EXPEDITED – INITIAL

Date: November 3, 2020

RE: *IRB #: LAU.SAS.NZ1.23/Mar/2020*

Protocol Title: Effects of Social Media Use and Dependence on Dietary Intake and Prevalence of Orthorexia in Pregnant Women vs. Non-Pregnant Women

Your application for the above referenced research project has been reviewed by the Lebanese American University, Institutional Review Board (LAU IRB). This research project qualifies as exempt under the category noted in the Review Type

This notice is limited to the activities described in the Protocol Exempt Application and all submitted documents listed on page 2 of this letter. Final reviewed consent documents or recruitment materials and data collection tools released with this notice are part of this determination and must be used in this research project.

CONDITIONS FOR ALL LAU NOTICE OF IRB EXEMPTION DETERMINATION

LAU RESEARCH POLICIES: All individuals engaged in the research project must adhere to the approved protocol and all applicable LAU IRB Research Policies. **PARTICIPANTS must NOT be involved in any research related activity prior to IRB notice date or after the expiration date.**

EXEMPT CATEGORIES: Activities that are exempt from IRB review are not exempt from IRB ethical review and the necessity for ethical conduct.

PROTOCOL EXPIRATION: **PROTOCOL EXPIRATION:** The LAU IRB notice expiry date for studies that fall under Exemption is 2 years after this notice, as noted above. If the study will continue beyond this date, a request for an extension must be submitted at least 2 weeks prior to the Expiry date.

MODIFICATIONS AND AMENDMENTS: Certain changes may change the review criteria and disqualify the research from exemption status; therefore, any proposed changes to the previously IRB reviewed exempt study must be reviewed and cleared by the IRB before implementation.

RETENTION: Study files must be retained for a period of 3 years from the date of project completion.

IN THE EVENT OF NON-COMPLIANCE WITH ABOVE CONDITIONS, THE PRINCIPAL INVESTIGATOR SHOULD MEET WITH THE REPRESENTATIVES OF THE IRB OFFICE IN ORDER TO RESOLVE SUCH CONDITIONS. IRB CLEARANCE CANNOT BE GRANTED UNTIL NON-COMPLIANT ISSUES HAVE BEEN RESOLVED.

If you have any questions concerning this information, please contact the IRB office by email at irb@lau.edu.lb

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| www.lau.edu.lb | | | | | |



The IRB operates in compliance with the national regulations pertaining to research under the Lebanese Minister of Public Health's Decision No.141 dated 27/1/2016 under LAU IRB Authorization reference 2016/3708, the international guidelines for Good Clinical Practice, the US Office of Human Research Protection (45CFR46) and the Food and Drug Administration (21CFR56). LAU IRB U.S. Identifier as an international institution: FWA00014723 and IRB Registration # IRB00006954 LAUIRB#1

Dr. Joseph Stephan
Chair, Institutional Review Board

DOCUMENTS SUBMITTED:

| | |
|---------------------------------------|---|
| LAU IRB Exempt Protocol Application | Received 28 October 2020 |
| Proposal | Received 29 October 2020 |
| Survey for Non-Pregnant Women | Received 28 October 2020 |
| Survey for Pregnant Women | Received 28 October 2020 |
| CITI Training – Nadine Zeeni | Cert.# 31976663 Dated (4 July 2019) |
| CITI Training – Yara Issa | Cert.# 39236724 Dated (1 November 2020) |
| CITI Training – Elissa El Ahmadieh | Cert.# 38824054 Dated (1 November 2020) |
| CITI Training – Mirabelle Tohme | Cert.# 38821209 Dated (5 October 2020) |
| CITI Training – Lara Helena El Moreck | Cert.# 38820613 Dated (5 October 2020) |

