

The 11-Item Weight-Related Behaviours Questionnaire-Short Form (WRB-Q-SF): New Psychometric Evidence for the Arabic Version in Pregnant Women

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Background: The 11-item short form of the Weight-Related Behaviours Questionnaire (WRB-Q-SF), is a psychosocial assessment instrument for the identification of women susceptible to excessive gestational weight gain. The present study proposes to examine the psychometric properties of an Arabic-language version of the WRB-Q-SF in a sample of Arabic-speaking pregnant women.

Methods: This cross-sectional study was conducted between October and December 2023, with six hundred eighty Lebanese pregnant women filling the survey. Data collected consisted of self-reported responses to standardized questionnaires. The data analysis model included confirmatory factor analysis (CFA) to test the factor structure, along with reliability analysis and correlations with external constructs to establish concurrent validity.

Results: Our study demonstrated good internal reliability values: self-efficacy ($\omega = 0.83$; $\alpha = .82$), attitudes towards weight gain ($\omega = 0.90$; $\alpha = .90$), and body image ($\alpha = 0.76$ and $.59$ respectively). Higher financial burden was suggested to be associated with higher self-efficacy and higher body image scores; lower emotional eating was correlated with higher attitudes towards weight gain and higher body image scores; whereas, increased social support and higher orthorexia were associated with higher attitudes towards weight gain. Here, we go into further depth about these results.

Conclusion: Overall, these results suggest that the Arabic WRB-Q-SF is a psychometrically valid tool for the assessment of excessive gestational weight gain. The availability of the Arabic translation and the eventual integration into actual maternity care practice may help pregnant women healthily gain weight.

Keywords: gestational weight gain, psychosocial, body image, weight gain attitudes, self-efficacy, psychometrics, Lebanon, Arabic

Introduction

Gestational weight gain (GWG) or the weight gained from the time of conception to the onset of labour, is a complex biological phenomenon, supporting growth and development of the foetus.¹ Maternal metabolic and physiologic changes as well as placental metabolism influence GWG.¹ For women with a normal pre-pregnancy weight or body mass index (BMI), the Institute of Medicine and National Research Council recommend an optimal GWG of 11.5–16 kilograms.² Prioritizing and encouraging a healthy start to life, including proper weight gain throughout pregnancy, has received attention on a global scale. Pregnancy-related dietary and physical activity routine, as well as subsequent GWG, are significant determinants of the short and long-term health of maternal and foetal health status.³ Pre-eclampsia,⁴

gestational diabetes mellitus,⁵ macrosomia,⁶ and increased probabilities of caesarean delivery have all been linked to GWG above reference ranges or excessive GWG.

There is a window of opportunity to encourage healthy behaviours throughout the prenatal period, such as a balanced diet that satisfies the nutritional reference values during pregnancy,³ and suggestions for physical activity.⁷ Less is known, though, regarding a woman's psychosocial ability to alter weight-related behaviour during pregnancy.⁸ Examples of psychosocial variables are body appearance, self-efficacy, locus of control, behaviours, convictions, values, support from others, depression, and anxiety.^{9,10} An expanding number of studies examines the associations, both direct and indirect, between these psychosocial variables and health-related behaviours,^{11,12} including their ability to affect GWG.^{9,10,13} Cohort studies conducted to date suggest that psychosocial factors like depression, weight gain attitudes, social support, and excessive GWG^{9,10} have temporal relationships with discontent with one's body image (which is typically measured as fulfilment with weight or physique or attitudes towards external appearance), even though no cause-and-effect relationships have yet been established.^{14,15} In particular, the literature describes poor family income and the lack of paid job as social variables linked to either excessive or insufficient GWG.¹⁶ Additionally, social support has a significant effect on how well expectant mothers manage their stress. The most important source of support for a pregnant woman is her immediate social network, which includes her partner, spouse, family, friends, midwife, and doctor. Pregnant women are better able to adjust to pregnancy-related changes when they have the right support from family, medical professionals, and the surrounding community.¹⁷ Evaluating social support can be helpful in assessing GWG. For instance, a previous study found that the presence of a strong family support was one of the most influential factors leading to excellent eating behaviours during pregnancy in a study involving 46 pregnant Mexican American adolescents.¹⁸ In addition, excessive GWG was shown to be a warning indicator of "Dieting" disorders and unhealthy eating^{19,20} and to be associated with emotional eating.²¹ While these findings emphasize the importance of psychosocial determinant of GWG, few psychometrically sound instruments exist to measure such constructs in pregnant women. Most studies have relied on adapted or fragmented scales rather than standardized tools, limiting comparability and validity across populations.^{9,22,23}

As research is determined to understand the "how" and "why" of excessive GWG, and to assess the psychosocial risk factors underscoring such an outcome²² during the vulnerable period of pregnancy, a paucity of pregnancy-specific measures have been developed to measure the GWG Psychosocial Risk construct. An example of psychosocial assessment tools is the Weight-Related Behaviours Questionnaire (WRB-Q), developed by Kendall et al.²⁴ The WRB-Q was designed based on a combination of psychosocial assessment instruments that were already in use from the literature on health behaviour. The entire questionnaire comprises a set of 49 items that use Likert scale responses to measure six psychosocial subscales; and no global score or subscale scoring system was in place when the WRB-Q was designed.²³ In 2021, Fealy et al²³ developed a shortened version of the WRB-Q, the WRB-Q-SF, reducing the length of the WRB-Q from 49 items spanning six psychosocial subscales to 11 items spanning three subscales that have a strong EGWG predictive value. This has made the measure quicker to complete, while maintaining significance to clinical outcomes and research practices. Items 1–4 of the questionnaire, which have a high chance of predicting excessive GWG, were taken from the self-efficacy subscale. These measures specifically addressed felt confidence over diet and food consumption. Lower chances of excessive GWG were related with greater perceived self-efficacy scores for consuming "good for you" meals and avoiding bad foods. The remaining eight of the eleven questions taken from the entire WRB-Q directly dealt with attitudes toward weight gain and/or weight shame (items 4–7) that were associated with greater odds of excessive GWG and body image dissatisfaction (items 8–11) where higher body image scores, which indicated more satisfaction with body image were correlated to a lower likelihood of suffering excessive GWG.²³ Knowing that with the exception of the weight locus of control scale (Cronbach's α 0.49),²⁵ all original six psychosocial subscales showed adequate internal consistency (Cronbach's alphas α > 0.70).²⁶ No other linguistic validation of the scale could be found while reviewing the literature. This absence of cross-cultural and linguistic validation represents a critical research gap. Without validated tools, psychosocial determinants of GWG in non-Western populations remain poorly captured, limiting both clinical application and global comparisons.

The Arab Context and Rationale of the Study

As a contribution to the literature, the current study sought to provide an Arabic validated version of the WRB-Q-SF for use among Arabic-speaking pregnant women. We argue that there are several reasons why this is important and required. First, from a practical standpoint, adopting an Arabic translation of the WRB-Q-SF assessment tool that has been psychometrically validated will considerably enhance the potential to assist in identifying women at risk of excessive prenatal weight gain, particularly across national and cultural groups. In fact, Arabic is widely spoken (by as many as 422 million people worldwide), and is one of the six official languages of the UN.²⁷ There is a general lack of availability of pregnancy-specific psychosocial assessment instruments,²³ more specifically in this linguistic group.

There are other reasons why studying GWG in the Arab population, may be beneficial. The eager modernization caused changes in lifestyle and nutrition²⁸ with a move toward “Westernized” eating patterns (eg, fast food, refined carbs;²⁹) and high levels of physical inactivity;³⁰ which resulted in a significant rise in the prevalence of metabolic disorders and overweight and obesity.^{31,32} Given the substantial negative effects of GWG on a mother’s and child’s health, it is essential to comprehend its prevalence and contributing factors across a range of communities in order to create evidence-based treatments and influence public health policy. It is challenging to compare or extrapolate the majority of the available data on GWG from studies carried out in Western nations to other regions of the world. In nations where starvation, poor weight gain, and maternal obesity are known to coexist, there have been few research examining patterns of weight gain and pre-pregnancy BMI.^{33–35} Thus, the urgency of this study lies in filling a double gap: the absence of pregnancy-specific psychosocial tools in Arabic, and the lack of context-sensitive data on GWG determinants in Arab societies undergoing rapid lifestyle transitions.

Objectives and Hypotheses

The novelty of this study resides in being the first to psychometrically validate the WRB-Q-SF, providing a brief, reliable and culturally adapted instrument for assessing psychosocial predictors of GWG. Beyond translation, this validation advances scientific understanding by enabling cross-cultural comparisons, informing targeted interventions and supporting evidence-based maternal health policy across the Arab world. We hypothesized that the Arabic WRB-Q-SF will show adequate validity and reliability in a sample of Arabic-speaking pregnant women from Lebanon. Additionally, and based on previously documented correlations, we expected that higher WRB-Q-SF scores will be associated with lower social support, increased financial burden, greater emotional eating, and less orthorexia, considering that the latter is focused on the food perceived quality in order to be healthy, free from concerns about one’s appearance or weight.³⁶

Methods

Procedures

Ethics approval for this study was obtained from Notre Dame des Secours Hospital, Byblos, Lebanon. All data were collected, between October 2023 and December 2023, via an online link created on Google Forms. All responses were exported into Microsoft Excel, checked for completeness, and subsequently imported into SPSS for analysis. The survey was shared via messaging applications and social media platforms, and participants were recruited from several gynaecologist clinics and hospitals in Lebanon. Inclusion criteria included being a pregnant woman, no matter the week of gestation, resident and citizen of Lebanon, and of adult age. Exclusion criteria included previously diagnosed ED. After providing informed consent, participants were asked to complete the questionnaire described above. Participants filled out the anonymous survey voluntarily and without receiving any sort of compensation.

Measures

Items belonging to the different scales were coded according to their original scoring instructions.

Gestational Weight Gain Psychosocial Risk

Participants completed a novel Arabic translation of the short form “Gestational Weight Gain Psychosocial Risk Assessment Tool” that assists in the detection of women at risk of excessive gestational weight gain.²³ The 11-item

scale is derived from the Weight-Related Behaviours Questionnaire (WRB-Q) initially developed by Kendall et al.²⁴ Within the scale are three psychosocial subscales: (1) “Self-efficacy”—3 items (5-point Likert scale ranging from 1= very sure to 5= very unsure), indicating confidence level for diet; (2) “Attitudes towards weight gain”—4 items (5-point Likert scale, 1= strongly agree to 5= strongly disagree), indicating personal feeling and/or acting towards gaining weight during pregnancy, and (3) “Body image”—4 items (2 items—4-point scale ranging from 0= very satisfied to 3= very dissatisfied and 2 items—reported on a 3-point scale ranging from 0= too heavy to 2= too light), indicating satisfaction towards body shape and weight. Higher scores indicated higher satisfaction with body image and were associated with a decreased risk of excessive gestational weight gain.²³ The Gestational Weight Gain Psychosocial Risk Assessment Tool was forward and back-translated. One translator, familiar with the terminology of the scale, performed the forward translation (English to Arabic), whereas a second translator, familiar with the concept of the scale as well, performed the back translation from Arabic to English.

Orthorexia Nervosa

To measure orthorexia nervosa, we used the Dusseldorf Orthorexia Scale (DOS), validated in Arabic, among the Lebanese population.³⁷ It is a reliable instrument to evaluate orthorexic eating patterns. Participants respond to the 10 items on a 4-point Likert scale, which range from 1 (never) to 4 (always).³⁸ The scale showed a good internal consistency of the measure ($\alpha = 0.85$).³⁷

Emotional Eating

Participants were asked to complete the Emotional Eating Scale (EES), a 25-item scale, validated in the Lebanon.³⁹ It assesses the management of certain emotions by eating. Within the scale are three subscales: anger, anxiety and depression. Anger, anxiety, and depression are the three subscales that compose the scale. Participants rate the degree to which a negative affect triggers appetite on a 5-point Likert scale. The total score, with 100 being the highest, is the sum of the responses to all the items. Higher scores indicate a tendency to rely on eating as a coping mechanism for emotions.⁴⁰ It has a Cronbach’s alpha of 0.957.

Demographics and Obstetrical Measures

Participants were requested to submit their demographic information, which included age, height and weight (data were used to compute self-reported BMI as kg/m²), place of residence, marital status (married or single with the latter including separated, divorced or widowed), educational level, occupation, household crowding index, financial burden, activity index score, number of pregnancies, if planned pregnancy, pregnancy method, pregnancy week and gestational weight gain.

Analytic Strategy

We used data from the second split-half to conduct a CFA using the SPSS AMOS v.29 software. A previous study suggested that the minimum sample size to conduct the CFA ranges from 3 to 20 times the number of the scale’s variables.⁴¹ Therefore, we assumed a minimum sample of 220 participants needed to have enough statistical power based on a ratio of 20 participants per one item of the scale, which was exceeded in this subsample. Our intention was to test the original model of the scale. Parameter estimates were obtained using the maximum likelihood method. Calculated fit indices were the normed model chi-square (χ^2/df), the root mean square error of approximation (RMSEA), the Tucker-Lewis Index (TLI) and the comparative fit index (CFI). Values ≤ 5 for χ^2/df , and $\leq .08$ for RMSEA, and .95 for CFI and TLI indicate good fit of the model to the data.⁴² Values of the average extracted variance >0.5 indicated adequate convergent validity. Multivariate normality was not verified at first (Critical ratio >5 and Bollen-Stine $p = 0.002$); therefore, we performed non-parametric bootstrapping procedure.

Internal reliability in both subsamples was assessed using McDonald’s ω and Cronbach’s alpha, with values greater than .70 reflecting adequate composite reliability.⁴³ To assess concurrent validity, Pearson test was used to correlate WRB-Q-SF scores with financial burden, social support, orthorexia and emotional eating scores.

Results

Participants' Characteristics

Six hundred eighty Lebanese pregnant women filled the survey, with a mean age of 28.66 ± 5.44 years. The majority (89.6%) of participants were married, while 10.4% were single (including separated, divorced and widowed). In terms of academic achievement, 77.6% had completed a higher education degree while 22.4% had completed secondary schooling or less.

Confirmatory Factor Analysis (CFA)

CFA indicated that fit of the four-factor model of the WRB-Q-SF was acceptable: $\chi^2/\text{df} = 225.55/38 = 5.94$, RMSEA = 0.085 (90% CI.075, 0.096), SRMR = 0.039, CFI = 0.943, TLI = 0.918. We added a correlation between residuals of items 1–8 since the modification index was high; the numbers improved as follows: $\chi^2/\text{df} = 183.18/37 = 4.95$, RMSEA = 0.076 (90% CI.065, 0.087), SRMR = 0.036, CFI = 0.956, TLI = 0.934. The standardised estimates of factor loadings were all adequate (Figure 1).

Internal Reliability

Internal reliability values were as follows: self-efficacy ($\omega = 0.83$; $\alpha = 82$), attitudes towards weight gain ($\omega = 0.90$; $\alpha = 90$), and body image ($\alpha = 0.76$ and 0.59 respectively). The AVE value was satisfactory = 0.61.

Concurrent Validity

Higher “self-efficacy” dimension of the WRB-Q-SF was significantly associated with higher financial burden ($\rho = 0.21$; $p < 0.001$) and lower emotional eating ($\rho = -0.12$; $p = 0.002$). Higher “attitudes towards weight gain” dimension of the WRB-Q-SF was significantly associated with more social support ($\rho = 0.49$; $p < 0.001$) and higher orthorexia ($\rho = 0.16$; $p = 0.002$) and lower emotional eating ($\rho = -0.44$; $p < 0.001$). Higher “body image” dimension of the WRB-Q-SF was significantly associated with more financial burden ($\rho = 0.13$; $p < 0.001$), higher orthorexia nervosa ($\rho = 0.09$; $p = 0.017$) and lower emotional eating ($\rho = -0.08$; $p = 0.043$) (Table 1).

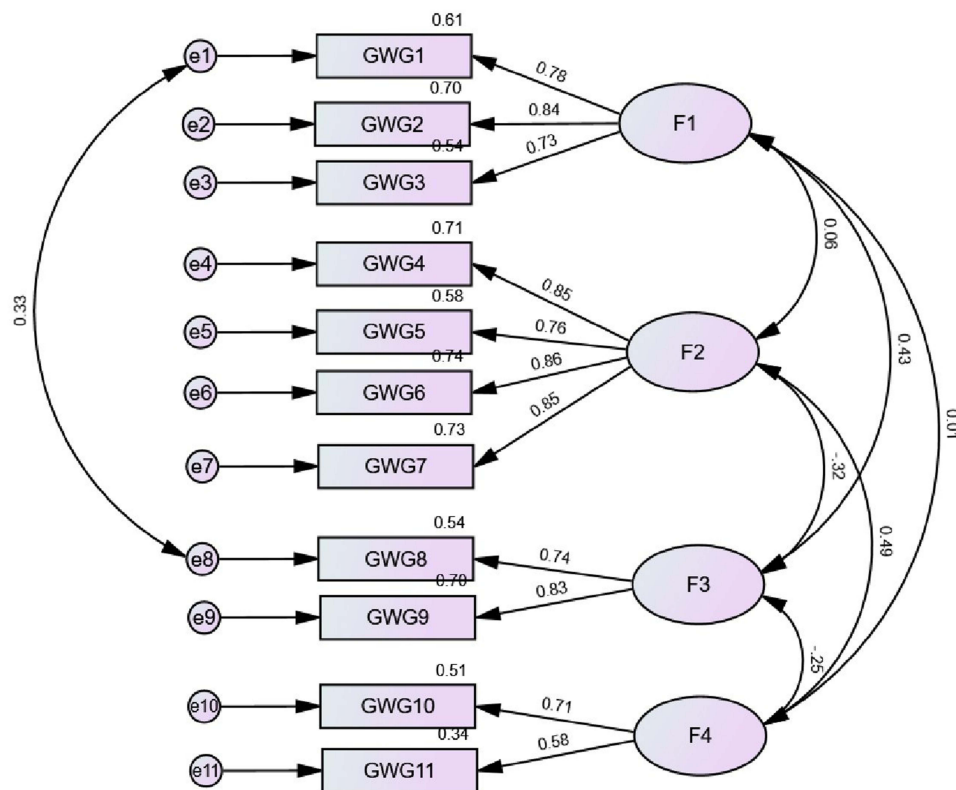


Figure 1 Standardised estimates of factor loadings of the four-factor model of the 11-item Weight-Related Behaviours Questionnaire-Short Form (WRB-Q-SF) in Arabic.

Table 1 Correlation Matrix

	Mean $\pm$ SD	1	2	3	4	5	6
1. WRB-Q-SF self-efficacy	7.62 $\pm$ 2.42	1					
2. WRB-Q-SF attitudes towards weight gain	12.37 $\pm$ 3.73	0.11**	1				
3. WRB-Q-SF body image	4.08 $\pm$ 1.44	0.36***	−0.02	1			
4. Social support	55.29 $\pm$ 21.91	0.05	0.49***	−0.06	1		
5. Financial burden	5.57 $\pm$ 2.34	0.21***	0.05	0.13***	0.10**	1	
6. Orthorexia	14.85 $\pm$ 7.36	−0.02	0.16***	0.09*	0.16***	−0.02	1
7. Emotional eating	47.91 $\pm$ 19.72	−0.12**	−0.44***	−0.08*	−0.47***	−0.15***	−0.23***

Notes: * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$. Numbers indicate Spearman correlation coefficients (ρ).

Abbreviations: WRB-Q-SF, Weight-Related Behaviours Questionnaire.

Discussion

Over the past ten years, there has been a significant increase in the amount of research on GWG. A revalidation of the WRB-Q within an Australian pregnancy cohort suggested that the questionnaire could be strengthened and shortened based on the deleted items modelling. As a result, Fealy et al²³ presented a shorter version of the WRB-Q from 49 items within six psychosocial subscales to 11 items across three subscales with high predictive value for excessive GWG. The present study sought to investigate the psychometric characteristics of a new Arabic translation of the WRB-Q-SF assessment tool as a contribution to this body of knowledge. To the best of our knowledge, this is the first translation and psychometric assessment of the WRB-Q-SF in Arabic. Findings demonstrated that the Arabic version is valid, reliable, and suitable for use among Arabic-speaking pregnant women.

In terms of factorial validity of the Arabic WRB-Q-SF assessment tool, our results are consistent with the initial validation study, with all eleven items retained.²³ Fit of the four-factor model of WRB-Q-SF assessment tool in the present study was adequate when tested using CFA. However, it will be important to examine the cross-national invariance of the WRB-Q-SF assessment tool scores, with more linguistic validations needed among a wider range of groups. The present results also indicated good internal consistency reliability of the scale with McDonald's ω values ranging from 0.86 to 0.90 for the included subscales. These values additionally confirm the reliability of the WRB-Q-SF assessment tool that has been demonstrated in the original validation,²³ where the three psychosocial subscales demonstrated acceptable internal consistency (Cronbach's alphas $\alpha > 0.70$).

As for concurrent validity, findings demonstrated that WRB-Q-SF scores significantly correlated, and in the expected direction, with relevant measures of financial burden, social support, emotional eating, orthorexia. These findings are in line with previous literature showing that a range of psychosocial factors can influence gestational weight, including financial distress, lack of social support, and eating pathologies (for review, see).⁴⁴ In particular, low social support during pregnancy was shown to correlate with inadequate weight gain.⁴⁵ Moreover, numerous previous studies revealed that financial distress contributes to significant effects on GWG rates.^{46,47} Poor economic status leads to inadequate consumption of healthy food which acts, in turn, as a barrier for a healthy GWG.⁴⁷

Interestingly, in our study, financial burden was positively associated with both self-efficacy and body image subscales scores, which might appear counterintuitive. One possible explanation is that women experiencing financial strain may feel compelled to be more self-reliant and disciplined in managing their diet and weight-related behaviours, reflecting a compensatory coping mechanism. Additionally, in Arab cultural contexts where body image and physical appearance are often emphasized,⁴⁸ economic hardship may not reduce women's psychological investment in maintaining body image, and may even amplify it.⁴⁹

Emotional eating is another issue often experienced by many pregnant women, which is mostly due to increased cortisol levels,⁴⁶ and can potentially result in excessive GWG. Finally, pregnant women tend to become mentally preoccupied with healthy eating, which increases the likelihood to develop orthorexic tendencies,⁵⁰ and a subsequent

increase in GWG.⁵¹ Overall, all these observations provide support to the validity and clinical utility of the Arabic WRB-Q-SF among Arabic-speaking pregnant women.

Study Limitations

There are several aspects of the current study that could be enhanced in subsequent research. First, our sample is unlikely to be representative of the larger Arab community given the recruitment strategy. Considering regional differences in nutrition literacy and physical activity, this may be particularly significant. The online survey format may also have excluded participants with limited internet access or lower digital literacy, potentially biasing the sample toward younger and more educated participants. To guarantee that the current findings are generalizable, it may be helpful in future studies to enlist larger representative samples of Arab adults, rather than just Lebanese. Second, any causal inferences are impossible due to the cross-sectional design. Finally, the fact that the study variables were evaluated using a self-reported instrument and may have been under- or overstated as a result was another drawback of the current analysis. While we assessed concurrent validity with related constructs, test-retest, convergent, divergent and discriminant validity with unrelated constructs were not examined, which should be addressed in future research.

Conclusion

Despite these limitations, the current findings imply that the Arabic WRB-Q-SF assessment tool scores have psychometric validity and that this translation can be used to assess the likelihood of excessive GWG in Arabic-speaking pregnant women. Importantly, examining the psychosocial components of excessive GWG from this brief measure early in pregnancy can help researchers and medical practitioners obtain a better understanding of the ability, readiness, and drive to modify health-related behaviours. Additionally, assessing these psychological elements collectively with the recently created short-form psychosocial assessment instrument could help in the development and execution of specialized health promotion programs that support pregnant women's mental and physical well-being as they optimize their weight gain. To our knowledge, this is the first validation of the WRB-Q-SF in Arabic, filling a critical gap in pregnancy-specific psychological assessment tools. The novelty of this study lies in providing a brief, culturally adapted, and psychometrically robust instrument for Arabic-speaking populations, where such validated tools are scarce. Beyond clinical practice, the impact of this work extends to advancing the science of GWG research by enabling cross-cultural comparisons, and guiding the design of evidence-based interventions and maternal health policies in Arab and Middle Eastern contexts.

Data Sharing Statement

All data generated or analyzed during this study are not publicly available due the restrictions from the ethics committee. Reasonable requests can be addressed to the corresponding author (Souheil Hallit; souheilhallit@usek.edu.lb).

Ethics Approval and Consent to Participate

The study protocol was approved by the ethics committee of the Notre-Dame des Secours University Hospital. An electronic/written informed consent was considered obtained from each participant when submitting the online form. All methods were carried out in accordance with relevant guidelines and regulations and complies with the Declaration of Helsinki.

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Author Contributions

All authors made a significant contribution to the work reported, whether that is in the conception, study design, execution, acquisition of data, analysis and interpretation, or in all these areas; took part in drafting, revising or critically

reviewing the article; gave final approval of the version to be published; have agreed on the journal to which the article has been submitted; and agree to be accountable for all aspects of the work.

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Disclosure

The authors report no conflicts of interest in this work.

References

1. Rasmussen KM, Yaktine AL.; Institute of Medicine (U.S.). Committee to Reexamine IOM Pregnancy Weight Guidelines. *Weight Gain During Pregnancy: Reexamining the Guidelines*. National Academies Press; 2009.
2. I of M. and Council NR. *Weight Gain During Pregnancy: Reexamining the Guidelines*. 2009, doi: 10.17226/12584.
3. Slater K, Rollo ME, Szewczyk Z, Ashton L, Schumacher T, Collins C. Do the dietary intakes of pregnant women attending public hospital antenatal clinics align with australian guide to healthy eating recommendations? *Nutrients*. 2020;12(8):1–14. doi:10.3390/nu12082438
4. Hutcheon JA, Stephansson O, Cnattingius S, Bodnar LM, Wikström AK, Johansson K. Pregnancy weight gain before diagnosis and risk of preeclampsia a population-based cohort study in nulliparous women. *Hypertension*. 2018;72(2):433–441. doi:10.1161/HYPERTENSIONAHA.118.10999
5. Hedderson MM, Gunderson EP, Ferrara A. Gestational weight gain and risk of gestational diabetes mellitus. *Obstetrics Gynecol*. 2010;115(3):597–604. doi:10.1097/AOG.0b013e3181cfce4f
6. Viswanathan M, Siega-Riz AM, Moos MK, et al. Outcomes of maternal weight gain. *Evid Rep Technol Assess*. 2008;2008:1–223.
7. Farpour-Lambert NJ, Eells LJ, Martinez de Tejada B, Scott C. Obesity and weight gain in pregnancy and postpartum: an evidence review of lifestyle interventions to inform maternal and child health policies. *Front Media S A*. 2018. doi:10.3389/fendo.2018.00546
8. Fealy S, Davis D, Foureau M, Attia J, Hazelton M, Hure A. The return of weighing in pregnancy: a discussion of evidence and practice. *Women Birth*. 2020;33(2):119–124. doi:10.1016/j.WOMBI.2019.05.014
9. Kapadia MZ, Gaston A, Van Blyderveen S, et al. Psychological antecedents of excess gestational weight gain: a systematic review. *BMC Pregnancy Childbirth*. 2015;15(1). doi:10.1186/s12884-015-0535-y
10. Hartley E, McPhie S, Skouteris H, Fuller-Tyszkiewicz M, Hill B. Psychosocial risk factors for excessive gestational weight gain: a systematic review. *Women Birth*. 2015;28(4):e99–e109. doi:10.1016/j.wombi.2015.04.004
11. Hill B, Skouteris H, Fuller-Tyszkiewicz M, Kothe EJ, McPhie S. A path model of psychosocial and health behaviour change predictors of excessive gestational weight gain. *J Reprod Infant Psychol*. 2016;34(2):139–161. doi:10.1080/02646838.2015.1118021
12. Bergmeier H, Hill B, Haycraft E, et al. Maternal body dissatisfaction in pregnancy, postpartum and early parenting: an overlooked factor implicated in maternal and childhood obesity risk. *Appetite*. 2020;147:104525. doi:10.1016/j.appet.2019.104525
13. de Jersey SJ, Mallan KM, Callaway LK, Daniels LA, Nicholson JM. Prospective relationships between health cognitions and excess gestational weight gain in a cohort of healthy and overweight pregnant women. *J Acad Nutr Diet*. 2017;117(8):1198–1209. doi:10.1016/j.jand.2016.12.011
14. Fealy S, Attia J, Leigh L, et al. Demographic and social-cognitive factors associated with gestational weight gain in an Australian pregnancy cohort. *Eat Behav*. 2020;39:101430. doi:10.1016/j.eatbeh.2020.101430
15. Fuller-Tyszkiewicz M, Skouteris H, Watson BE, Hill B. Body dissatisfaction during pregnancy: a systematic review of cross-sectional and prospective correlates. *J Health Psychol*. 2013;18(11):1411–1421. doi:10.1177/1359105312462437
16. da S. Magalhães EI, Maia DS, Bonfim CFA, Netto MP, Lamounier JA, da S. Rocha D. Prevalência e fatores associados ao ganho de peso gestacional excessivo em unidades de saúde do sudoeste da Bahia. *Revista Brasileira de Epidemiologia*. 2015;18(4):858–869. doi:10.1590/1980-5497201500040014
17. Skurzak A, Kicia M, Wiktor K, Iwanowicz-Palus G, Wiktor H. Social support for pregnant women. *Polish J Public Health*. 2015;125(3):169–172. doi:10.1515/pjph-2015-0048
18. Gutierrez YM. Cultural factors affecting diet and pregnancy outcome of Mexican American adolescents. *J Adolesc Health*. 1999;25(3):227–237. doi:10.1016/S1054-139X(99)00016-6
19. Zanardo V, Cavaliere A, Giliberti E, et al. Gestational weight gain and eating-related disorders. *J Obstet Gynaecol*. 2021;41(8):1205–1209. doi:10.1080/01443615.2020.1854699
20. Gerontidis A, Grammatikopoulou MG, Tzimos C, et al. Effectors of pregorexia and emesis among pregnant women: a pilot study. *Nutrients*. 2022;14(24):5275. doi:10.3390/nu14245275
21. Blau LE, Orloff NC, Flammer A, Slatch C, Hormes JM. Food craving frequency mediates the relationship between emotional eating and excess weight gain in pregnancy. *Eat Behav*. 2018;31:120–124. doi:10.1016/J.EATBEH.2018.09.004
22. Ockenden H, Gunnell K, Giles A, et al. Development and preliminary validation of a comprehensive questionnaire to assess women's knowledge and perception of the current weight gain guidelines during pregnancy. *Int J Environ Res Public Health*. 2016;13(12):1187. doi:10.3390/ijerph13121187
23. Fealy S, Leigh L, Hazelton M, et al. Translation of the weight-related behaviours questionnaire into a short-form psychosocial assessment tool for the detection of women at risk of excessive gestational weight gain. *Int J Environ Res Public Health*. 2021;18(18):9522. doi:10.3390/ijerph18189522
24. Kendall A, Olson CM, Frongillo EA. Evaluation of psychosocial measures for understanding weight-related behaviors in pregnant women psychosocial measures for pregnancy. 2001. Available from: <https://academic.oup.com/abm/article/23/1/50/4631490>. Accessed October 30, 2025.
25. Fealy S, Attia J, Leigh L, et al. A revalidation of the weight related behaviours questionnaire within an australian pregnancy cohort. *Midwifery*. 2021;97:102951. doi:10.1016/j.MIDW.2021.102951

26. Tavakol M, Dennick R. Making sense of Cronbach's alpha. *Int J Med Educ.* 2011;2:53. doi:10.5116/IJME.4DFB.8DFD
27. United Nations Official Languages.
28. Hashim M, Radwan H, Hasan H, et al. Gestational weight gain and gestational diabetes among Emirati and Arab women in the United Arab Emirates: results from the MISC cohort. *BMC Pregnancy Childbirth.* 2019;19(1). doi:10.1186/s12884-019-2621-z
29. Naja F, Nasreddine L, Itani L, et al. Dietary patterns and their association with obesity and sociodemographic factors in a national sample of Lebanese adults. *Public Health Nutr.* 2011;14(9):1570–1578. doi:10.1017/S136898001100070X
30. Chamieh MC, Moore HJ, Summerbell C, Tamim H, Sibai AM, Hwalla N. Diet, physical activity and socio-economic disparities of obesity in Lebanese adults: findings from a national study disease epidemiology - chronic. *BMC Public Health.* 2014;15(1). doi:10.1186/s12889-015-1605-9
31. Nasreddine L, Naja F, Chamieh MC, Adra N, Sibai A-M, Hwalla N. Trends in overweight and obesity in Lebanon: evidence from two national cross-sectional surveys (1997 and 2009). 2012. Available from: <http://www.biomedcentral.com/1471-2458/12/798>. Accessed October 30, 2025.
32. Dhaheri ASA, Mohamad MN, Jarrar AH, et al. A cross-sectional study of the prevalence of metabolic syndrome among young female Emirati Adults. *PLoS One.* 2016;11(7):e0159378. doi:10.1371/JOURNAL.PONE.0159378
33. El Rafei R, Abbas HA, Charafeddine L, et al. Association of pre-pregnancy body mass index and gestational weight gain with preterm births and fetal size: an observational study from Lebanon. *Paediatr Perinat Epidemiol.* 2016;30(1):38–45. doi:10.1111/PPE.12249
34. Almurshed KS, Bani IA, Al-Kanhal MA, Al-Amri MA. A study of maternal dietary intake during pregnancy in Riyadh, Saudi Arabia.
35. Yekta Z, Ayatollahi H, Porali R, Farzin A. The effect of pre-pregnancy body mass index and gestational weight gain on pregnancy outcomes in urban care settings in Urmia-Iran. *BMC Pregnancy and Childbirth.* 2006;6(1). doi:10.1186/1471-2393-6-15
36. Donini LM, Barrada JR, Barthels F, et al. A consensus document on definition and diagnostic criteria for orthorexia nervosa. *Eating Weight Disorders.* 2022;27(8):3695–3711. doi:10.1007/s40519-022-01512-5
37. Rogoza R, Hallit S, Soufia M, Barthels F, Obeid S. Validation of the Arabic version of the Dusseldorf Orthorexia Scale (DOS) among Lebanese adolescents. *J Eat Disord.* 2021;9(1). doi:10.1186/s40337-021-00488-4
38. Barthels F, Meyer F, Pietrowsky R. Die Düsseldorf Orthorexie Skala–Konstruktion und Evaluation eines Fragebogens zur Erfassung orthorektischen Ernährungsverhaltens. *Zeitschrift für klinische Psychol Psychother.* 2015;44(2):97–105. doi:10.1026/1616-3443/A000310
39. Rahme C, Obeid S, Sacre H, et al. Emotional eating among Lebanese adults: scale validation, prevalence and correlates. *Eating Weight Disorders.* 2021;26(4):1069–1078. doi:10.1007/S40519-020-01001-7/METRICS
40. Saade S, Hallit S, Haddad C, et al. Factors associated with restrained eating and validation of the Arabic version of the restrained eating scale among an adult representative sample of the Lebanese population: a cross-sectional study. *J Eat Disord.* 2019;7(1). doi:10.1186/s40337-019-0254-2
41. Mundfrom DJ, Shaw DG, Ke TL. Minimum sample size recommendations for conducting factor analyses. *Int J Test.* 2005;5(2):159–168. doi:10.1207/s15327574ijt0502_4
42. Hu L, Bentler PM. Cutoff criteria for fit indexes in covariance structure analysis: conventional criteria versus new alternatives. *Structl Equation Modeling.* 1999;6(1):1–55. doi:10.1080/10705519909540118
43. Dunn TJ, Baguley T, Brunsden V. From alpha to omega: a practical solution to the pervasive problem of internal consistency estimation. *Br J Psychol.* 2014;105(3):399–412. doi:10.1111/BJOP.12046
44. Athar U, Daud NUA, Khan WA, Khalid A, Gill SI. Caught between external pressures and internal battles: psychosocial factors affecting gestational weight gain - a scoping review. *Cureus.* 2021;13(2). doi:10.7759/CUREUS.13487
45. Plante AS, Lemieux S, Labrecque M, Morisset AS. Relationship between psychosocial factors, dietary intake and gestational weight gain: a narrative review. *J Obstet Gynaecol Can.* 2019;41(4):495–504. doi:10.1016/J.JOGC.2018.02.023
46. Braig S, Logan CA, Reister F, Rothenbacher D, Genuneit J. Psychosocial stress and longitudinally measured gestational weight gain throughout pregnancy: the Ulm SPATZ Health Study. *Sci Rep.* 2020;10(1). doi:10.1038/S41598-020-58808-8
47. Dolin CD, Gross RS, Deierlein AL, et al. Predictors of gestational weight gain in a low-income hispanic population: sociodemographic characteristics, health behaviors, and psychosocial stressors. *Int J Environ Res Public Health.* 2020;17(1):352. doi:10.3390/IJERPH17010352
48. Abou Tayeh S, Hallit R, Malaeb D, et al. Translation and validation of the Arabic body image-acceptance and action Questionnaire-5 (BI-AAQ-5) for adults. *J Eat Disord.* 2025;13(1). doi:10.1186/s40337-025-01302-1
49. Yetsenga R, Banerjee R, Streatfield J, et al. The economic and social costs of body dissatisfaction and appearance-based discrimination in the United States. *Eat Disord.* 2024;32(6):572–602. doi:10.1080/10640266.2024.2328461
50. Kadioğlu M, Ü O. The effects of eating disorders on pregnancy and postpartum period. *J Women's Heal Nurs.* 2017;3:40–53.
51. Taştekin Ouyaba A, Çiçekoğlu Öztürk P. The effect of the information-motivation-behavioral skills (IMB) model variables on orthorexia nervosa behaviors of pregnant women. *Eat Weight Disord.* 2022;27:361–372.

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