The relationship between daily healthy lifestyle and sports activity in pregnant women

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ABSTRACT

The aim of this study was to assess the general health status, daily life-healthy dietary patterns, and sports activity level of pregnant women, and to explore their relationship with the body mass index (BMI) of these women. This cross-sectional study employed descriptive and analytical methods. A total of 198 pregnant women from healthcare centers in Qasabat Al-Tafila participated. A questionnaire was developed consisting of two sections: demographic information, and a second section that included 38 questions distributed across three sub-domains: (1) General Health Status, (2) Daily Life-Healthy Dietary Patterns, and (3) Sports Activity. Statistical analyses were performed using SPSS (V20). The women's general health status was rated as high (M=0.69), while both daily life-healthy dietary patterns (M=0.468) and sports activity (M=0.573) were rated as medium. The analysis showed statistically significant positive correlations between general health status, daily life-healthy dietary patterns, and sports activity with BMI ($p < 0.01$). Further, the results of multiple linear regression analysis indicated that these factors significantly influence BMI ($p < 0.05$). These findings highlight the important role of general health, daily life-healthy dietary patterns, and physical activity in shaping the BMI of pregnant women in Tafila Governorate. The study emphasizes the importance of promoting and maintaining a balanced and active lifestyle for pregnant women to optimize their health and well-being.

KEYWORDS

1. INTRODUCTION

Excessive weight and weight gain during pregnancy are linked to a range of immediate and long-term health issues for both mothers and their children. For mothers, these risks include a higher likelihood of developing gestational diabetes, high blood pressure during pregnancy, cesarean section, retaining weight after childbirth, pre-eclampsia, lasting obesity, and future conditions such as diabetes and heart disease (Stuebe et al., 2009; Vézina-Im et al., 2018).

Furthermore, a sedentary lifestyle during pregnancy poses a substantial health risk, notably increasing the likelihood of deep vein thrombosis, which endangers both maternal and infant health. This inactive lifestyle also heightens the risk of obesity or may contribute significantly to lasting weight gain (Cooper & Yang, 2023).

Physical activity during pregnancy has been found to reduce the risks of macrosomia, gestational diabetes, excessive gestational weight gain, preeclampsia, cesarean delivery, lower back pain, pelvic girdle pain, and urinary incontinence (Gascoigne et al., 2023; Cooper & Yang, 2023). Similarly, maintaining a healthy diet during pregnancy is recognized as one of the most crucial factors in supporting the best health outcomes for both mother and baby (Mate et al., 2021).

In most developing nations, often referred to as third-world countries, the majority of the population faces severe economic and social challenges, including inadequate nutrition, water contamination, illness epidemics, and lack of access to basic education (Gariballa et al., 1998). Among the most important causes of malnutrition is the lack of awareness about consuming a complete diet that meets individual nutritional needs (Mazahreh & Al-Sa'ida, 2009). Another factor is the adherence to specific nutritional lifestyles. Therefore, through health nutrition education, we must help people understand their behaviors and how these impact their health, encouraging them to make healthy choices without forcing changes upon them. Health nutrition education promotes behaviors that enhance health, prevent illness, and aid in disease recovery (Mazahreh, 2020). Pregnant women should manage their weight carefully during pregnancy, as overweight is a common issue, often stemming from misconceptions. This weight gain frequently persists after childbirth.

Despite the achievements made by Jordan in the field of primary and reproductive health care, women's health services still face many challenges, especially in areas far from the capital, such as the south or north regions, where the need for integrated health services for Jordanian women of all ages has arisen. The idea of establishing specialized centers concerned with the health of Jordanian women emerged to enhance the provision of comprehensive health services and reproductive health

for Jordanian women in less fortunate regions. As a first step, this specialized center for the care of women's health was established in the Tafila Governorate to provide various types of services related to women's health through the presence of distinguished specialized clinics for women of all ages in the exact location, with high quality, for women in the Tafila Governorate and the rest of the southern governorates.

The aim of this study is to assess the general health status, daily life-healthy dietary patterns, and sports activity of pregnant women, and to explore their relationship with the body mass index (BMI) of these women.

2. METHODS

2.1. Study Design and Participants

This cross-sectional study employed descriptive and analytical methods. The study population consisted of all pregnant women who visited the healthcare centers in Qasabat Al-Tafila. The study sample was selected using the stratified random sampling method, taking into account the proportions of community characteristics. A total of 270 pregnant women were included in the study sample, and the questionnaire was distributed to all of them. By the end of the data collection process, the number of completed questionnaires valid for analysis was 198.

Table 1 provides demographic characteristics of the pregnant women in the study. The majority (62.12%) are aged between 18 and 35 years, with 37.88% falling within the 36–45 years age group. In terms of family size, most participants (57.58%) come from households with 4–7 members, while 29.80% have more than 7 members. A significant portion of the women (71.21%) hold a Bachelor's degree, and the majority (64.65%) report a household income between 300–700 JOD. Regarding housing, most participants live in homes with 3–5 rooms (83.84%).

Table 1. Participant characteristics

Variables	Category	Frequency	Percentage
Age	18 – 35 years	123	62.12%
	36 – 45 years	75	37.88%
Family size	Three members or less	25	12.62%
	4 – 7 members	114	57.58%
	More than 7	59	29.80%
Educational Qualification	High school or less	35	17.68%
	Bachelor's degree	141	71.21%

	Graduate studies	22	11.11%
Household income	Less than 300 JOD	48	24.24%
	300 – 700 JOD	128	64.65%
	More than 700 JOD	22	11.11%
Number of rooms in the house	Three rooms or less	18	9.09%
	3 – 5 rooms	166	83.84%
	More than five rooms	14	7.07%

2.2. Study instrument

A questionnaire was developed based on a review of theoretical literature and previous studies related to the topic of the current research. It consisted of two sections:

The first section collected demographic information about the study participants, including age, family size, educational qualification, family income, and the number of rooms in the house.

The second section included 38 questions, which were distributed across three sub-domains. The first sub-domain, "General Health Status," consisted of 9 questions (items 1–9) and focused on health issues derived from medical records, with responses scored as follows: a good result received a score of 1, while a poor result received a score of 0. The second sub-domain, " Daily life-healthy dietary patterns," included 16 questions (items 10–25), which assessed participants' eating habits. The third sub-domain, "Sports Activity," contained 9 questions (items 26–34) related to physical activity. Finally, the "Pregnancy-Specific Features" section included 4 questions (items 35–38), which were answered using a two-point scale (yes/no). A score of 1 was given for a "yes" answer, and 0 for a "no" answer.

2.2.1. Instrument validity

The validity of the questionnaire was verified in several ways:

- Apparent Validity: The questions were distributed according to the relevant field and were reviewed by a panel of five experienced and qualified experts to assess the validity, comprehensiveness, linguistic integrity, and relevance of each question to its field. Based on feedback from the panel, amendments were made, and an agreement of over 80% was achieved among the experts. The questionnaire was then approved in its final form.

- Internal Consistency Validity: To assess the construct validity of the questionnaire, a pilot test was conducted with an exploratory sample of 30 pregnant women, who were not part of the study sample. The corrected correlation coefficient between each field score and the total score of the questionnaire was calculated, as well as the corrected correlation coefficient between the score of each question and its respective field. The results are presented in Table 2, which shows the corrected correlation coefficient between the field score and the total score of the questionnaire. It is evident that the correlation coefficients for the fields of the questionnaire with the total score ranged from 0.60 to 0.75, indicating a high degree of internal consistency. This reflects a strong validity of the questionnaire, which can be trusted (Table 2).

Table 2. Correlation coefficients between field scores and total questionnaire scores

No.	Field	Correlation coefficient
1	General Health	0.60
2	Daily healthy diet	0.73
3	Sports activity	0.75

Table 3 below presents the corrected correlation coefficient between the paragraph score and the degree of the field to which it belongs. It is evident that the correlation coefficients between the paragraph score and the degree of the field to which they belong ranged from 0.44 to 0.92. Since all of these values are greater than 0.30, the questionnaire was considered valid in its final form (Table 3).

Table 3. Corrected correlation coefficient between paragraph score and corresponding field score

Paragraph number	**Correlation coefficient	Paragraph number	**Correlation coefficient
9	0.64	22	0.69
10	0.56	24	0.71
11	0.49	25	0.76
12	0.72	26	0.81
13	0.68	27	0.92
14	0.60	28	0.73
15	0.51	29	0.78
16	0.53	30	0.69
17	0.52	31	0.60
18	0.65	32	0.55
20	0.45	33	0.67
		34	0.44

***The presence of statistical significance at the level of significance ($\alpha = 0.01$)*

2.2.2. Instrument reliability

The internal consistency coefficient was estimated using Cronbach's Alpha formula for the questionnaire applied to the pilot sample of 30 pregnant women. Table 4 presents the results.

Table 4. Cronbach's alpha reliability coefficients "α" for the fields of the questionnaire and the overall questionnaire

#	Scope / Resolution	Cronbach's alpha stability coefficients "α" for the pilot sample
1	General Health	0.78
2	A healthy diet, daily life	0.79
3	Sport activities	0.87
5	The total score of the questionnaire	0.91

Table 4 shows that the stability coefficients, estimated using Cronbach's alpha (α) for the survey sample, resulted in an overall stability score of 0.91 for the questionnaire. The stability coefficients for the following sections are as follows:

1. The first domain name is general health status (0.78).
2. The second field is daily life-healthy dietary patterns (0.79).
3. The third field is sports activity (0.87).

Each questionnaire item has a two-step scale to indicate the level of agreement among study participants, as follows:

- (No) is assigned a score of zero.
- (Yes) is assigned a score of one.

For the general health status item, which consists of one question, responses are scored as follows: "Good" is assigned a score of 1, and "Bad" is assigned a score of 0.

To assess the level of agreement in terms of strength, weakness, and direction on a three-point Likert scale, the values (weights) were calculated as shown in Table 5.

Table 5. Weights for degree of approval, strength or weakness, and direction based on the three-point Likert scale

Weight	Weighted average	Inclusion's Degree
1	0 to 0.33	Weak
2	0.334 to 0.666	Medium
3	0.667 to 1	High

2.3. Statistical Analysis

Statistical analyses were performed using SPSS V20 to answer the study's questions. The internal consistency of the study tool was verified using the corrected correlation coefficient, and Cronbach's Alpha was applied to estimate reliability. Descriptive statistics, including frequencies, percentages, means, and standard deviations, were used to describe the sample and calculate the variation in responses. Multiple regression analysis was used to assess the impact of independent variables (general health status, daily diet, sports activity) on the dependent variable (BMI), while Pearson correlation determined the relationship between the variables. Additionally, the determination factor and effect size were applied to evaluate the model's effectiveness and the strength of the relationships.

3. RESULTS

The results of the study are presented below, focusing on the general health status, daily life-healthy dietary patterns, and physical activity of pregnant women in Tafila Governorate. Table 6 presents the general health status of pregnant women, with the results showing that the general health status was rated as high (M= 0.69; SD=0.33715).

Table 6. General health status of study participants

Paragraph number	Paragraph	SMA	Standard Deviation	Judging on averages
9	General Health	0.69	0.33715	High

The results related to the healthy daily life eating patterns for pregnant women in Tafila Governorate are presented below. Table 7 shows that the level of healthy dietary patterns in daily life was rated as medium, with an average score of 0.468. The responses in this area varied, with some paragraphs rated as high and others as weak.

Table 7. Healthy dietary patterns in daily life of study participants

Paragraph number	Paragraph	SMA	Standard Deviation	Judging on averages
10	I eat breakfast in the morning	0.8444	0.38096	High
14	I eat three meals a day	0.8046	0.44431	High
16	I focus on fresh vegetables and fruits in my food	0.8000	0.44451	High
15	I eat meat, fish, or chicken every day	0.7616	0.48511	High
11	I drink milk every day	0.7000	0.53027	High
12	Drink coffee or tea before eating any food	0.3285	0.49942	Weak
17	I eat much fast food like burger	0.3188	0.51504	Weak
18	I drink much coffee a day	0.3091	0.55782	Weak
20	I drink much tea a day	0.3083	0.53419	Weak
22	I drink soft drinks (Cola, Pepsi) a lot during the day	0.3000	0.29410	Weak
25	I watch TV too often	0.2999	0.57504	Weak
24	My sleep is disrupted, and I wake up a lot while I sleep at night	0.2083	0.57200	Weak
13	I can smoke in the morning before eating any food	0.1034	0.50082	Weak
	Overall score: 0.468	**Medium**		

The level of sports activity among pregnant women in Tafila Governorate is shown in Table 8. The results indicate that the level of sports activity was rated as medium, with an arithmetic mean of 0.573.

Table 8. Level of sports activity among study participants

Paragraph number	Paragraph	SMA	Standard Deviation	Judging on averages
29	Do you walk?	0.9943	0.3421	High
33	Do you exercise in low heat?	0.9873	0.3429	High
32	Do you exercise in high heat?	0.9764	0.4398	High
27	Do you play Swedish sports?	0.6733	0.4532	High
26	Do you do psychological exercises?	0.5630	0.5409	Medium
28	Do you swim?	0.3328	0.6543	Weak
30	Do you play skipping rope?	0.3055	0.4522	Weak
31	Do you practice self-defense games?	0.1954	0.6754	Weak
32	Do you exercise?	0.1273	0.6529	Weak
	Medium	**Overall score: 0.573**		

The relationship between general health status, daily life-healthy dietary patterns, sports activity, and body mass index (BMI) of pregnant women is presented in Table 9. Table 9 shows a

direct and statistically significant correlation at the 0.01 level ($\alpha \leq 0.01$) between general health status, daily life-healthy dietary patterns, sports activity, and BMI. The correlation coefficients for general health status, healthy diet, and daily lifestyle with BMI were 0.632, 0.558, and 0.549, respectively, all with a significance level of 0.000.

Table 9. Relationship between general health status, healthy eating patterns, daily lifestyle, sports activity, and BMI

Pearson Correlation Coefficient	BMI	
	Correlation coefficient	Indication level
General health status	0.632	**0.000
Daily life-healthy dietary patterns	0.558	**0.0000
Sports activity	0.549	**0.0000

To determine the effect of general health status, daily life-healthy dietary patterns, and sports activity on the BMI of pregnant women and to assess the effect size and the effectiveness of the proposed equation, multiple linear regression analysis was performed. The results are shown in Table 10. The table shows that general health status, daily life-healthy dietary patterns, and sports activity significantly affect BMI of pregnant women in Tafila Governorate ($\alpha \leq 0.05$), with a calculated value of "q" of 193.64 and a significance level of 0.00. The coefficient of determination (R^2) is 43%, indicating that the model explains 43% of the variability in BMI, with the remaining 57% attributed to other factors. Thus, a statistically significant relationship exists between these factors and BMI (Table 10).

Table 10. Results of multiple regression analysis and effect size for BMI in study participants

Independent variable	The source of the contrast	Sum of squares	Freedom degrees	Average of squares	Value (F)	Indication level	The coefficient of determination R^2
General Health	Regression	5216.196	1	2608.098	193.64	*0.000	0.43
Daily life-healthy dietary patterns	Residuals	6923.007	515	13.469			
	Total	12139.203	516				
Sports activities							

Statistically significant at the level of significance ($\alpha \leq 0.05$)

The multiple regression equation for this model can predict a pregnant woman's body mass index (BMI) based on general health status, daily life-healthy dietary patterns, and sports activity, as shown in Table No. (11).

Table 11. Multiple regression equation predicting BMI in pregnant women

The components of the equation	Value (B)	Standard error	Beta parameter	Value (v)	Indication level
Regression constant	3.898-	0.404		9.642-	*0.00
General Health	2.060	0.119	0.593	17.366	*0.00
Daily life-healthy dietary patterns	1.012	0.195	0.177	5.187	*0.00
Sport activities	1.008	0.178	0.201	5.029	*0.00

Statistically significant at the level of significance ($\alpha \leq 0.05$).

It is evident from Table 11 that general health status, healthy dietary patterns in daily life, and sports activity were statistically significant at the significance level ($\alpha \leq 0.05$). The computed "t" values were (-9.642, 17.366, 5.187, 5.029), with significance levels of (0.00, 0.000, 0.000, 0.00), respectively. Therefore, the multiple regression equation is as follows:

Body Mass Index (BMI) = -3.898 + 2.060 (general health status) + 1.012 (daily life-healthy dietary patterns) + 1.008 (sports activity).

4. DISCUSSION

The study results revealed several key findings regarding the general health, dietary patterns, and physical activity of pregnant women in Tafila Governorate. The general health status of the women was rated as high, with a mean score of 0.69. In contrast, their daily life-healthy dietary patterns were rated as medium, with an average score of 0.468, while the level of sports activity was also rated as medium, with a mean score of 0.573. The analysis showed statistically significant positive correlations between general health status, daily life-healthy dietary patterns, and sports activity with BMI ($p < 0.01$). Further, the results of multiple linear regression analysis indicated that these factors significantly influence BMI ($p < 0.05$), with a model explaining 43% of the variability in BMI. These findings underscore the significant role of general health, daily life-healthy dietary patterns, and physical activity in shaping the BMI of pregnant women in Tafila Governorate.

Consistent with previous research highlighting the benefits of physical exercise during pregnancy (Gascoigne et al., 2023; Hinman et al., 2015), this study found that the pregnant women exhibited very good overall health. Furthermore, their daily life-healthy dietary patterns were rated as medium. This aligns with earlier studies by Moafi et al. (2018); Cheu et al. (2019), which also reported that dietary habits in the region were somewhat adhered to, especially in terms of healthy eating patterns. These findings underscore the critical importance of proper nutrition and food security for maternal health.

Furthermore, this study revealed that participants were moderately active during the study period, which corresponds with research suggesting that moderate exercise offers benefits for both mothers and their babies post-delivery (Kasoha et al., 2023; Kristin, 2005). In addition, our study found a strong correlation between health status, diet, exercise, and BMI, reinforcing the findings of Meander et al. (2021), who also identified a link between physical activity and positive health outcomes, such as reduced gestational weight gain. However, our findings differ from those of Altaş et al. (2023), who found that pregnant women often become less active during pregnancy. While the current study shares some similarities with international studies, it also offers unique insights that contribute to the broader understanding of maternal health, particularly in relation to health behaviors and their impact on BMI during pregnancy.

Despite the moderate ratings for healthy eating patterns and physical activity, the high general health status of the participants indicates that these areas may still play a crucial role in overall maternal health. Further research could explore specific barriers or facilitators to adopting healthier eating habits and increasing physical activity during pregnancy in the region. Understanding these factors will be important for developing targeted interventions that could help improve health outcomes for both mothers and their babies, ensuring that the benefits of a balanced diet and regular exercise are more widely realized within this community.

5. CONCLUSIONS

In conclusion, the general health status of pregnant women who participated in this study was high, indicating a positive overall health level. The daily life-healthy dietary patterns were rated as medium, suggesting room for improvement in dietary habits. Similarly, the moderate level of sports activity among pregnant women suggests an opportunity to increase physical activity. The study identified a positive relationship between general health status, daily life-healthy dietary patterns, sports activity, and the BMI of pregnant women. These findings emphasize the importance of

maintaining a healthy lifestyle and regular physical activity for optimal BMI outcomes during pregnancy. The study also proposed a multiple regression equation that can be used to predict a pregnant woman's BMI based on general health status, healthy dietary patterns in daily life, and sports activity. Overall, the study underscores the significance of promoting and maintaining a balanced and active lifestyle for pregnant women to optimize their health and well-being.

6. RECOMMENDATIONS

Based on the study results, it is recommended to promote awareness and interventions aimed at improving daily life-healthy dietary patterns and physical activity among pregnant women in Tafila Governorate. While the general health status of the women was rated high, the medium ratings for dietary patterns and sports activity suggest opportunities for improvement. Healthcare providers should focus on encouraging healthier eating habits and more consistent physical activity to further enhance overall health and manage BMI effectively during pregnancy. These efforts could help optimize maternal health and reduce the risks associated with unhealthy BMI levels.

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All authors listed have made a substantial, direct and intellectual contribution to the work, and approved it for publication.

CONFLICTS OF INTEREST

The authors declare no conflict of interest.

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