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The Effect of a Self-Efficacy-Enhancing Intervention on Perceived Self-Efficacy and Actual Adherence to Healthy Behaviours Among Women with Gestational Diabetes Mellitus

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تأثير تدخل تعزيز الكفاءة الذاتية على الكفاءة الذاتية المتصورة والإلتزام الحقيقي بالسلوكيات

الصحية عند النساء المصابات بسكري الحمل

إيمان الهاشمي، فليشا هودج، كارابي ناندي، إليزابيث توماس، ماري-لن بيريشث

ABSTRACT: Objectives: This study aimed to evaluate the effectiveness of a self-efficacy-enhancing intervention (SEEI) on perceived self-efficacy and actual adherence to healthy behaviours among women with gestational diabetes mellitus (GDM). **Methods:** This comparative pre-post study was conducted at the Antenatal Clinic of the Sultan Qaboos University Hospital, Muscat, Oman, between October 2016 and January 2017. A total of 90 adult Omani women with GDM were randomised to either a control group receiving standard prenatal care or a SEEI group. The SEEI group received an additional health education session and biweekly text messages to encourage adherence to healthy behaviours. All participants completed self-reported standardised questionnaires to determine perceived self-efficacy and actual adherence at baseline and after four weeks. **Results:** At baseline, there were no significant differences between the control and SEEI groups in mean scores for perceived self-efficacy (122.9 ± 19.9 versus 118.2 ± 19.5 ; $P = 0.26$) or actual adherence to healthy behaviours (3.1 ± 1.2 versus 3.2 ± 1.0 ; $P = 0.23$). However, after four weeks, there was a significant positive difference between the SEEI and control groups in terms of pre-post change in scores for both perceived self-efficacy (9.9 ± 19.6 versus -1.8 ± 17.6 ; $P < 0.05$) and actual adherence to healthy behaviours (1.5 ± 1.1 versus 0.4 ± 0.8 ; $P < 0.01$). **Conclusion:** The SEEI was found to significantly improve perceived self-efficacy and actual adherence to healthy behaviours among a group of Omani women with GDM.

Keywords: Attitude to Health; Health Behaviors; Self Efficacy; Patient Adherence; Gestational Diabetes; Oman.

الملخص: الهدف: هدفت هذه الدراسة إلى تقييم تأثير تدخل تعزيز الكفاءة الذاتية على الكفاءة الذاتية المتصورة والإلتزام الحقيقي بالسلوكيات الصحية بين النساء المصابات بسكري الحمل. **الطريقة:** في هذه الدراسة تمت مقارنة مجموعتين قبل وبعد أخذ المعلومات في عيادة ما قبل الولادة في مستشفى جامعة السلطان قابوس، مسقط، عمان، في الفترة ما بين أكتوبر 2016 ويناير 2017. وتم اختيار 90 امرأة عمانية مصابة بسكري الحمل بصورة عشوائية ليكن إما ضمن مجموعة أولى ضابطة تتلقى فقط الرعاية الصحية القياسية لما قبل الولادة، أو مع مجموعة ثانية تتلقى تدخل تعزيز الكفاءة الذاتية. بالإضافة للرعاية الصحية القياسية تلقت مجموعة التدخل جلسة توعية صحية إضافية ورسائل نصية كل أسبوعين لتشجيع الإلتزام بالسلوكيات الصحية. أكملت جميع المشاركات استبيانات موحدة تم تعبئتها ذاتياً لتحديد الكفاءة الذاتية المتصورة والإلتزام الفعلي بالسلوكيات الصحية على مرحلتين: مرحلة أساسية قبل بداية البحث، وبعد ذلك بأربعة أسابيع. **النتائج:** أظهرت نتائج المرحلة الأساسية عدم وجود فروق ذات دلالة إحصائية بين المجموعة الضابطة ومجموعة التدخل في متوسط درجات الكفاءة الذاتية المدركة (122.9 ± 19.9 مقابل 118.2 ± 19.5 ; $P = 0.26$)، أو الإلتزام الحقيقي بالسلوكيات الصحية (3.1 ± 1.2 مقابل 3.2 ± 1.0 ; $P = 0.23$). ولكن وجد اختلاف إيجابي كبير بين المجموعتين في المرحلة الثانية، من حيث معدل التغيير في الدرجات لكل من الفعالية الذاتية المدركة (9.9 ± 19.6 مقابل -1.8 ± 17.6 ; $P < 0.05$) والإلتزام الحقيقي بالسلوكيات الصحية (1.5 ± 1.1 مقابل 0.4 ± 0.8 ; $P < 0.01$). **الخلاصة:** تم التوصل إلى أن تدخل تعزيز الكفاءة الذاتية أفضى إلى تحسن في الكفاءة الذاتية المتصورة وفي الإلتزام الحقيقي بالسلوكيات الصحية عند مجموعة من النساء العمانيات المصابات بسكري الحمل.

الكلمات المفتاحية: الموقف اتجاه الصحة: السلوكيات الصحية: الكفاءة الذاتية: الإلتزام المريض؛ سكري الحمل؛ عمان.

ADVANCES IN KNOWLEDGE

- This study found that a self-efficacy-enhancing intervention (SEEI) improved perceived self-efficacy and actual adherence to healthy behaviours among a group of Omani women with gestational diabetes mellitus (GDM).

APPLICATION TO PATIENT CARE

- Encouraging adherence to healthy lifestyle choices and behaviours can reduce the incidence of GDM-related maternal and neonatal complications among women with GDM.

- To this end, nurses can incorporate health education, goal-setting and planning, role modelling, mastery experience and motivational messages in SEEIs adapted to the unique needs of pregnant women with GDM.

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GESTATIONAL DIABETES MELLITUS (GDM) IS defined as glucose intolerance which begins or is first recognised during pregnancy and generally ceases in the postpartum period.¹ Typically, GDM screening and diagnosis occur between 24–28 gestational weeks using a two-step approach. First, a one-hour non-fasting 50 g glucose challenge test is performed which, if abnormal (>140 mg/dL), is followed by a three-hour fasting 100 g oral glucose tolerance test (OGTT). A GDM diagnosis is indicated if at least two values exceed fasting glucose cut-off values at base-line (>105 mg/dL) or one hour (>190 mg/dL), two hours (>165 mg/dL) or three hours (>145 mg/dL) later.²

Worldwide, the prevalence of GDM is increasing, particularly among specific ethnic groups.^{3,4} According to the Ministry of Health, the rate of GDM in Oman increased from 1.2% in 2000 to 9.2% in 2016.⁵ This is most probably due to the impact of globalisation and changes in lifestyle and health-related behaviours.⁶ Self-care is a crucial aspect of GDM management in order to avoid the development of maternal and neonatal complications.^{1,7} Self-care measures include lifestyle modifications (e.g. diet and physical activity) and self-monitoring blood glucose (BG) levels.⁸ However, limited adherence to recommended behaviours is a major problem, especially during the relatively short span of pregnancy.¹ According to the recommendations of the World Health Organization, it is crucial that women take an active role and develop their capacity for making healthy choices during pregnancy in order to improve maternal and neonatal health.⁹

Few studies have investigated the best strategies to improve adherence to healthy behaviours among pregnant women with GDM.¹⁰ Perceived self-efficacy has been identified as a strong predictor of healthy behaviours, such as weight loss, dietary modification and physical activity among diabetic patients.¹¹ Reliance on relevant knowledge and coping strategies is not sufficient to enhance adherence to a healthy lifestyle; women with GDM require critical self-efficacy attributes, such as perceived outcome expectations, positive reinforcement, a high level of confidence and the necessary determination to attain their desired goals.¹¹ Accordingly, this study aimed to evaluate the effectiveness of a self-efficacy-enhancing intervention (SEEI) for improving perceived self-efficacy and actual adherence to healthy behaviours among a group of Omani women with GDM.

Methods

This comparative pre-post study was conducted at the Antenatal Clinic of the Sultan Qaboos University Hospital (SQUH), Muscat, Oman, from October 2016 to Jan-

uary 2017. The sample was composed of >18-year-old Omani women with singleton pregnancies at <33 gestational weeks who had been diagnosed with GDM. Women with multiple gestation pregnancies, type 1 or type 2 diabetes mellitus (T2DM), chronic medical problems that prevented them from exercising, mental illnesses or complications requiring bedrest were excluded from the study. In addition, non-Arabic-speaking women were also excluded.

As per standard SQUH protocols, all of the women had undergone a two-hour 75 g OGTT between 24–28 gestational weeks. Women were diagnosed with GDM if either their fasting or two-hour BG levels exceeded 124 or 154 mg/dL, respectively. The sample size was calculated according to Cohen's recommended effect size, taking into consideration physical and financial constraints. In order to determine differences between independent two-population means, assuming a power of 80% with a one-tailed alpha level of 0.05 and medium effect size of 0.6, a total of 70 subjects were required. Incorporating a 20% attrition rate, the final required sample size was set at 90 subjects.

The participant recruitment process was coordinated with the help of outpatient department health-care providers who had been trained for this purpose. A list of all Omani women diagnosed with GDM and attending SQUH during the study period was generated on a daily basis. Women were selected from this list using a random number generator and invited to participate in the study while they were attending antenatal appointments. Participants attending antenatal appointments on Sundays, Tuesdays and Thursdays were assigned to the intervention group, while those attending on Mondays and Wednesdays were assigned to the control group. Participants in the control group received standard antenatal care, including routine antenatal visits, monthly blood sugar profiles, fasting blood sugar testing at every visit, glucose monitoring at home and individualised educational sessions with a diabetes dietician.

In addition to standard care, the SEEI group took part in an individualised health education intervention utilising different self-efficacy-enhancing strategies (i.e. motivational messages, role modelling, goal-setting and mastery experience) designed to encourage women to maintain recommended healthy behaviours. First, the participants watched an educational video designed solely for the purposes of the study. The video focused on general information about GDM and GDM-related maternal and neonatal complications, as well as information about the importance of healthy lifestyle behaviours—such as a healthy diet, exercise and maintaining self-monitored BG levels to prevent GDM complications—and measures to prevent post-partum T2DM.

The physical activities recommended in the video conformed with standard cultural beliefs and religious practices in Oman by focusing on safe exercises which could be conducted indoors and in private (i.e. walking, swimming and dancing).

After watching the video, participants in the SEEI group were encouraged to practice the recommended activities during the session. The participants were provided with a BG metre and were trained to check and record their BG levels; they were requested to do this four times per day during the study period. In order to enhance adherence to the recommended healthy behaviours, the participants were encouraged to write down specific and measurable goals. A pamphlet summarising the content of the educational session was distributed to all participants before the end of the session. In addition, they received short biweekly motivational text messages for four weeks to reinforce the information given during the educational session. Finally, a refresher session was given at 32–35 gestational weeks via telephone.

Both participants in the control and SEEI groups completed a 15-minute survey to gather demographic information. In addition, two instruments were administered to determine perceived self-efficacy and actual adherence to healthy behaviours. All of the instruments were administered to the participants in Arabic. The revised 20-item Diabetes Management Self-Efficacy Scale (DMSES) was used to measure perceived self-efficacy in adhering to healthy behaviours related to management of GDM.¹² The original tool is divided into four subscales (nutrition-specific/weight, nutrition-general/medical treatment, exercise and BG monitoring) and is scored on a five-point scale.¹³ The revised DMSES tool is scored on an 11-point scale and has been deemed to have good reliability (Cronbach's alpha value: 0.89) and test-retest reliability (intra-class correlation coefficient: 0.77).¹²

The revised 11-item Summary of Diabetes Self-Care Activities (SDSCA) scale was used to measure the actual frequency of self-care behaviours.¹⁴ This tool evaluates five domains of diabetes-specific management, including diet, exercise, BG monitoring, foot care and smoking over the preceding seven days. Responses are scored from 0–7 (one point for each day of the week), with the total score ranging from 0–35, with higher scores suggestive of greater engagement in healthy behaviours.¹⁴ However, for the purposes of the study, the smoking and foot care subscales were excluded. Additionally, minor changes were made to the wording of certain items to make them GDM-specific. The internal reliability of the original tool has been well established, with high inter-item correlation (mean = 0.47) and moderate test-retest correlation (mean = 0.40).¹⁴ All partic-

ipants completed the questionnaires to determine their baseline pre-test scores prior to the start of the educational session, which was subsequently initiated for the SEEI group immediately after the pre-test questionnaires were completed. Post-test questionnaires were filled out by both groups four weeks after completion of the pre-test questionnaires.

Data were analysed using the Statistical Package for the Social Sciences (SPSS), Version 24.0 (IBM Corp., Armonk, New York, USA). All results were checked for outliers or missing data and to determine if there was a need for transformation or non-parametric methods. Continuous variables were presented as means and standard deviations and categorical variables were presented as frequencies and percentages. An independent t-test was used to determine differences in perceived self-efficacy scores between the two groups. A mediation analysis was conducted to determine differences in actual adherence to healthy behaviours. Assumptions for each method were checked and amended appropriately. The level of statistical significance was set at $P \leq 0.05$.

Ethical approval for this study was obtained from the Institutional Review Board of the University of California Los Angeles (IRB #16-001343) as well as the Medical Research & Ethics Committee of SQUH (MREC #1370). All women provided written informed consent prior to their participation in the study.

Results

A total of 199 Omani women with GDM were selected for the study, of which 95 (47.7%) met the inclusion criteria. Of these, 90 (94.7%) women were invited to participate in the study and were randomly allocated to either the SEEI group ($n = 45$; 50%) or the control group ($n = 45$; 50%). All of the participants completed the pre- and post-tests, with a 0% attrition rate. The mean age of the women was 33.5 ± 5.1 years (range: 19–43 years old). The mean pre-pregnancy weight and body mass index was 70.9 ± 17.9 kg (range: 42–155 kg) and 29.0 ± 7.0 kg/m² (range: 17.4–60.6 kg/m²). The majority (85.5%) had been educated to high school level or above and 54.4% were currently employed. Most women (61.1%) did not have a previous history of GDM; however, 78.9% and 32.2% had a family history of T2DM and GDM, respectively. Overall, 61.1% of the women had previously received health education regarding GDM, although only 9.1% reported receiving such information from a nurse. There were no significant differences between the two groups with regards to clinical and demographic characteristics, apart from a history of GDM in previous pregnancies ($P < 0.01$) [Table 1].

Table 1: Demographic and clinical characteristics of a group of Omani women with gestational diabetes mellitus (N = 90)

Characteristic	n (%)			P value
	Total	Control group (n = 45)	SEEI group (n = 45)	
Mean age in years ± SD	33.5 ± 5.1	33.5 ± 5.3	33.6 ± 4.9	0.23*
Mean pre-pregnancy weight in kg ± SD	70.9 ± 17.9	70.9 ± 16.4	70.9 ± 19.5	0.47*
Mean BMI in kg/m ² ± SD	29.0 ± 7.0	29.1 ± 6.4	28.9 ± 7.6	0.45*
Mean gravidity ± SD	4.0 ± 2.4	4.0 ± 2.2	4.0 ± 2.6	0.48*
Mean parity ± SD	2.3 ± 1.8	2.5 ± 1.8	2.2 ± 1.8	0.20*
Mean GA in weeks at GDM diagnosis ± SD	20.1 ± 7.5	19.7 ± 7.8	20.5 ± 7.3	0.29*
Place of residence				
Muscat	45 (50)	25 (55.6)	20 (44.4)	0.40†
Elsewhere	45 (50)	20 (44.4)	25 (55.6)	
Education level				
Primary school or below	13 (14.4)	6 (13.3)	7 (15.6)	0.09†
High school	30 (33.3)	18 (40)	12 (26.7)	
College	40 (44.4)	16 (35.6)	24 (53.3)	
Graduate	7 (7.8)	5 (11.1)	2 (4.4)	
Employment status				
Employed	49 (54.4)	23 (51.1)	26 (57.8)	0.33†
Unemployed	41 (45.6)	22 (48.9)	19 (42.2)	
Housemaid availability				
Yes	51 (56.7)	26 (57.8)	25 (55.6)	0.50†
No	39 (43.3)	19 (42.2)	20 (44.4)	
Family history of T2DM				
Yes	71 (78.9)	33 (73.3)	38 (84.4)	0.15†
No	19 (21.1)	12 (26.7)	7 (15.6)	
Previous history of GDM				
Yes	35 (38.9)	12 (26.7)	23 (51.1)	<0.01†
No	55 (61.1)	33 (73.3)	22 (48.9)	
Family history of GDM				
Yes	29 (32.2)	14 (31.1)	15 (33.3)	0.50†
No	61 (67.8)	31 (68.9)	30 (66.7)	
History of baby birth weight of >4 kg				
Yes	2 (2.2)	0 (0)	2 (4.4)	0.24†
No	88 (97.8)	45 (100)	43 (95.6)	
Current GDM treatment				
Diet only	44 (48.9)	22 (48.9)	22 (48.9)	0.47†
Diet and exercise	22 (24.4)	12 (26.7)	10 (22.2)	
Diet and hypoglycaemic agents	17 (18.9)	8 (17.8)	9 (20)	
Diet, exercise and hypoglycaemic agents	7 (7.8)	3 (6.7)	4 (8.9)	
Prior GDM health education				
Yes	55 (61.1)	27 (60)	28 (62.2)	0.50†
No	35 (38.9)	18 (40)	17 (37.8)	

SEEI = self-efficacy-enhancing intervention; SD = standard deviation; BMI = body mass index; GA = gestational age; GDM = gestational diabetes mellitus; T2DM = type 2 diabetes mellitus. *Using a t-test. †Using a Chi-squared test.

Table 2: Perceived self-efficacy* and actual adherence to healthy behaviours† scores at baseline and four weeks later among a group of Omani women with gestational diabetes mellitus (N = 90)

Score	Mean ± SD			P value
	Total	Control group (n = 45)	SEEI group (n = 45)	
DMSES				
At baseline	120.6 ± 19.8	122.9 ± 19.9	118.2 ± 19.5	0.26
At follow-up	124.6 ± 22.1	121.1 ± 23.0	128.1 ± 20.8	0.14
Change	4.0 ± 19.4	-1.8 ± 17.6	9.9 ± 19.6	<0.05
SDSCA				
At baseline	3.1 ± 1.1	3.1 ± 1.2	3.2 ± 1.0	0.23
At follow-up	4.1 ± 1.2	3.5 ± 1.1	4.7 ± 1.0	<0.01
Change	1.0 ± 1.1	0.4 ± 0.8	1.5 ± 1.1	<0.01
SDSCA diet subscale				
At baseline	4.0 ± 1.3	3.9 ± 1.4	4.0 ± 1.2	0.73
At follow-up	4.8 ± 1.2	4.4 ± 1.3	5.1 ± 1.1	<0.05
Change	0.8 ± 1.1	0.5 ± 1.1	1.1 ± 1.2	<0.05
SDSCA PA subscale				
At baseline	2.1 ± 2.1	1.8 ± 2.0	2.4 ± 2.0	0.24
At follow-up	3.8 ± 2.4	2.6 ± 2.3	4.9 ± 1.9	<0.01
Change	1.7 ± 2.3	0.8 ± 1.9	2.5 ± 2.3	<0.01
SDSCA BG subscale				
At baseline	2.5 ± 2.0	2.5 ± 2.2	2.5 ± 1.9	0.96
At follow-up	3.1 ± 1.9	2.5 ± 1.8	3.7 ± 1.7	<0.05
Change	0.6 ± 2.3	0.0 ± 0.3	1.2 ± 0.3	<0.05

SEEI = self-efficacy-enhancing intervention; SD = standard deviation; DMSES = Diabetes Management Self-Efficacy Scale; SDSCA = Summary of Diabetes Self-Care Activities Assessment; PA = physical activity; BG = blood glucose. *Self-assessed using the revised 20-item DMSES tool.¹² †Self-assessed using the revised 11-item SDSCA scale.¹⁴ For the purposes of the current study, the foot care and smoking subscales were excluded.

There were no significant differences in perceived self-efficacy or actual adherence scores between the two groups at baseline. However, following the intervention, there was a significant positive difference between the SEEI and control groups in terms of pre-post change in perceived self-efficacy scores (9.9 ± 19.6 versus -1.8 ± 17.6; *P* < 0.05). According to Cohen's effect size (*d* = 0.43), this difference was of low-to-medium practical significance. In addition, a significant difference was seen between the SEEI and control groups with regards to pre-post change in actual adherence scores (1.5 ± 1.1 versus 0.4 ± 0.8; *P* < 0.01). This difference represented a large effect according to Cohen's effect size (*d* = 1.14). Specifically, there were significant differences between the SEEI and control groups in terms of pre-post changes in scores for the adherence to diet (1.1 ± 1.2 versus 0.5 ± 1.1; *P* < 0.05), adherence to physical activity (2.5 ± 2.3 versus 0.8 ± 1.9; *P* < 0.01) and adherence to BG testing (1.2 ± 0.3 versus 0.0 ± 0.3; *P* < 0.05) subscales [Table 2].

In addition, findings from the mediation analysis implied a significant direct effect between group assign-

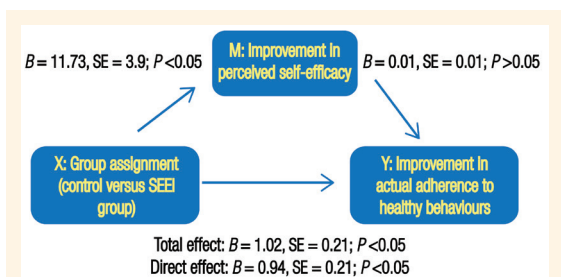


Figure 1: Diagram showing standardised regression coefficients for the relationship between group assignment and improvement in actual adherence to healthy behaviours as mediated by improvement in perceived self-efficacy in a group of Omani women with gestational diabetes mellitus (N = 90).

SE = standard error; M = mediator; X = predictor; Y = outcome; SEEI = self-efficacy-enhancing intervention.

ment and pre-post changes in adherence score ($P < 0.05$) [Figure 1]. However, there was a non-significant indirect effect of group assignment on pre-post changes in adherence score via pre-post changes in perceived self-efficacy score ($B = 0.09$, standard error = 0.07; bias-corrected and accelerated confidence interval = $-0.01-0.28$). The change in perceived self-efficacy score accounted for 3% of the total effect.

Discussion

In the current study, the SEEI resulted in a significant improvement in perceived self-efficacy and actual adherence to healthy behaviours among a group of Omani women with GDM. Previous research has similarly documented the effectiveness of educational interventions in increasing perceived self-efficacy, particularly those incorporating self-efficacy-enhancing strategies such as motivational messages, role modelling, goal-setting and mastery experience.¹⁵⁻¹⁸ In contrast, other studies have demonstrated fluctuations in self-efficacy over time, whereby educational interventions have resulted in short-term improvements but are not beneficial in sustaining long-term improvements in self-efficacy.^{19,20}

In particular, the SEEI group in the current study demonstrated significant improvements in actual adherence to BG monitoring, diet and physical activity behaviours. Gaston *et al.* similarly found that pregnant women who received persuasive messages were more likely to adhere to physical activity habits and exercises.¹⁵ Although participants in the current study demonstrated good baseline adherence to healthy behaviours—possibly as a result of previous health education measures received during the antenatal period—there was nevertheless a significant positive change in adherence following the four-week intervention.

The current study assessed the influence of perceived self-efficacy as a potential predictor of adherence

to healthy behaviours. However, perceived self-efficacy was not found to be a significant predictor of adherence to healthy behaviours after controlling for group assignment. Although there is limited evidence on the relationship between self-efficacy and adherence among women with GDM, this finding contradicts those of earlier studies conducted among women with a history of GDM, participants with T2DM and the general population.²¹⁻²³ One possible explanation for this could be that the four-week follow-up period used in the current study was too short to demonstrate an influencing effect. However, the mediation analysis revealed that the improvement in self-efficacy partially mitigated the impact of group assignment in improving adherence to healthy behaviours, accounting for 3% of the total effect. This finding supports the possibility that improvements in self-efficacy may not have a complete mediation effect on group assignment and improvement in adherence to healthy behaviours.

According to the Health Belief Model, various other demographic (i.e. gender, age, ethnicity, economic status and educational level), structural (i.e. knowledge of and prior contact with a disease) and psychosocial (i.e. personality type, social class and peer pressure) variables may mediate health behaviours.²⁴ These mediators were not evaluated in the current study; therefore, further research is necessary to consider the effect of other possible mediators of adherence to healthy behaviours among women with GDM.

Improved adherence to healthy behaviours decreases the incidence of GDM-related maternal and neonatal complications as well as the financial burden such complications place on the healthcare system.^{1,7,25} The findings of the present study provide a foundation for future research seeking to determine strategies to improve adherence to healthy behaviours among women with GDM. In clinical practice, nurses can incorporate various self-efficacy-enhancing strategies such as goal-setting and planning, role modelling, mastery experience and motivational messages when delivering health education sessions that have been adapted to the unique needs of pregnant women with GDM. Such measures may serve to improve the overall quality of healthcare services provided to these patients.

The major strength of the present study was its quasi-experimental design which permitted an investigation of the effectiveness of the intervention while controlling for certain variables among the participants, thus allowing greater confidence in the findings. Using validated questionnaires to measure study variables and the lack of participant dropouts were additional strengths. However, the study was subject to several limitations that should be acknowledged. As the sample was composed of pregnant Omani women with GDM,

the study findings have limited generalisability to other populations. Moreover, a larger sample size would have provided stronger statistical power by preventing the possibility of type two error. Finally, the effect of the intervention on self-efficacy and adherence was measured after only four weeks; thus, the long-term effects of the SEEI could not be determined.

Conclusion

This pre-post comparative study sought to test the effect of a health education intervention incorporating various self-efficacy-enhancing strategies on perceived self-efficacy and actual adherence to healthy behaviours in a group of Omani women with GDM. The SEEI was found to significantly improve perceived self-efficacy as well as actual adherence to healthy behaviours. However, the study failed to detect a positive relationship between self-efficacy and adherence to healthy behaviours. Future research should focus on testing this relationship utilising a larger sample and considering other possible mediators of adherence among pregnant women with GDM.

AUTHOR CONTRIBUTIONS

Dr Iman Al-Hashmi conceived and planned the study intervention. Dr Iman Al-Hashmi wrote the manuscript with support from Professor Felicia Hodge, Dr Karabi Nandy and Dr Elizabeth Thomas. Professor Felicia Hodge supervised the project. Dr Karabi Nandy and Dr Mary-Lynn Brecht verified the analytical methods. Dr Karabi Nandy supervised the findings of this study. All authors provided critical feedback and helped shape the research, analysis and manuscript.

CONFLICT OF INTEREST

The authors declare no conflicts of interest.

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