



Original Article

Influence of Self-Efficacy on Self-Care Practices Among Women with Gestational Diabetes in Peshawar Pakistan: An Application of Orem's Self-Care Theory

Riffat Shoukat¹, Hafizah Che Hassan¹, Fazia Ghaffar²

¹School of Nursing and Applied Science, Lincoln University College, Kota Bharu, Malaysia

²Department of Food and Nutrition, University of Peshawar, Peshawar, Pakistan

*Corresponding Author: Riffat Shoukat, Email: riffatphdsholar@lincoln.edu.my

Abstract

Introduction: Gestational diabetes mellitus (GDM) presents considerable risks to both maternal and fetal health, making effective self-care essential for favorable pregnancy outcomes. Self-efficacy, defined as an individual's confidence in performing health-related behaviors, plays a crucial role in self-care adherence. Orem's Self-Care Theory offers a comprehensive framework for evaluating and strengthening patients' self-care abilities. This study investigated the effect of self-efficacy on self-care behaviors among women with GDM in Peshawar, Pakistan, guided by Orem's Self-Care Theory.

Methods: A quasi-experimental pretest-posttest design was conducted among 220 women identified with GDM attending Hayatabad Medical Complex. Participants were randomly allocated to either an intervention group (n=110), which received a structured self-care education program, or a control group (n=110), which received routine antenatal care. The culturally tailored educational module focused on dietary management, physical activity, blood glucose monitoring, medication compliance, stress control, and sleep hygiene. Data were collected through questionnaire based on Orem's model and analyzed using descriptive statistics and paired t-tests.

Results: Groups were comparable at baseline. Post-intervention, the experimental group showed significant improvements in physical activity, diet, sleep, and stress management ($P < 0.001$), with higher self-efficacy and reduced self-care deficits ($P = 0.040$). The control group showed no significant change.

Conclusion: Theory-based education enhancing self-efficacy improves self-care in women with GDM. Applying Orem's Self-Care Theory in antenatal care can strengthen patient empowerment and pregnancy outcomes in resource-limited settings.

Keywords: Gestational diabetes mellitus, Self-efficacy, Self-care practices, Orem's Self-Care Theory, Maternal health, Pakistan

Received: January 5, 2026, Accepted: January 17, 2026, ePublished: March 27, 2026

Introduction

Gestational diabetes mellitus (GDM) is a form of glucose intolerance that develops during pregnancy and affects both maternal and fetal health. Although GDM often resolves after delivery, it substantially increases the mother's risk of developing type 2 diabetes and other metabolic complications later in life.^{1,2}

The management of GDM primarily depends on the woman's capacity for effective self-care, as daily behaviors largely determine glycemic control and pregnancy outcomes.³

Self-care in GDM includes monitoring blood glucose levels, adhering to prescribed dietary and medication regimens, engaging in physical activity, and maintaining a healthy lifestyle.^{4,5} Women who consistently practice self-care are more likely to achieve optimal glucose control and prevent adverse outcomes such as macrosomia, preeclampsia, and cesarean delivery.⁶ However, studies have shown that adherence to self-care practices among women with GDM remains suboptimal due to factors

such as limited awareness, psychosocial stress, and low confidence in one's ability to manage the disease.⁷

Orem's Self-Care Theory offers a valuable nursing framework for understanding and enhancing self-care among individuals with health deviations. The theory defines self-care as a learned and purposeful behavior that individuals perform to maintain health and well-being.⁸ Within this framework, nurses play a pivotal role in assessing self-care deficits and supporting patients through education and motivation.⁹

Self-efficacy, a concept rooted in Bandura's social cognitive theory, refers to a person's belief in their ability to perform specific actions to achieve desired outcomes.¹⁰ Individuals with higher self-efficacy are more likely to initiate and maintain health-promoting behaviors, even in challenging circumstances.¹¹ In the context of GDM, self-efficacy has been identified as a critical determinant of self-care adherence, influencing dietary control, blood glucose monitoring, and physical activity.¹²

Several studies report that enhancing self-efficacy



through structured education, nurse-led counseling, and behavioral interventions improves self-care behaviors and metabolic outcomes in women with GDM.^{13, 14} Despite growing evidence, gaps remain in understanding how self-efficacy interacts with self-care requisites in different populations, especially within the theoretical lens of Orem's Self-Care Model. Therefore, this study aims to examine the influence of self-efficacy on self-care practices among women with gestational diabetes, guided by Orem's theoretical framework.

Methods

This study adopted a quantitative quasi-experimental pretest–posttest design to assess the influence of self-efficacy on self-care practices among women diagnosed with gestational diabetes mellitus (GDM). The design allowed comparison of participants' knowledge, attitudes, and self-care practices before and after the implementation of a structured health education module.

The research was conducted in district Peshawar, Khyber Pakhtunkhwa, Pakistan. Participants were assigned to two groups: an experimental group that received a structured health education module and a control group that continued routine antenatal care and received a standard informational leaflet. The educational module, developed under Orem's Self-Care Theory, focused on empowering women through self-care training in areas such as diet, glucose monitoring, physical activity, medication adherence, and stress management.¹⁵

The study population comprised Pashtun women diagnosed with GDM attending antenatal clinics at the Medical Teaching Institute, Hayatabad Medical Complex (HMC), Peshawar. Eligible participants were those aged above 20 years, with a gestational age of at least 14 weeks, able to read and understand Pashto, and willing to provide informed consent. Women with pre-existing type 1 or type 2 diabetes, severe comorbidities, mental illness, or obstetric complications were excluded.

A consent-based random sampling method was used at the time of the first antenatal registration. A total of 220 pregnant women were enrolled, equally divided into an experimental group ($n=110$) and a control group ($n=110$). The sample size was determined using G*Power analysis, ensuring adequate statistical power for the planned comparisons.

Data were collected using a structured, self-administered questionnaire developed in accordance with Orem's Self-Care Theory.¹⁶ The instrument consisted of four domains: (1) self-care agency (12 items), (2) self-care requisites (10 items), (3) self-care deficits (8 items), and (4) knowledge, attitudes, and dietary practices related to gestational diabetes (20 items). Items within the self-care domains were measured using a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). Knowledge items were multiple-choice questions scored as correct (1) or incorrect (0), while dietary practice items were assessed using a 4-point frequency scale (never to

always). Domain scores were summed, with higher scores indicating greater self-care capacity, improved knowledge, and healthier practices.

Content validity was established through expert review by specialists in endocrinology, obstetrics, and nursing education.¹⁶ Internal consistency reliability was evaluated using Cronbach's alpha, yielding values of 0.82 for self-care agency, 0.79 for self-care requisites, 0.76 for self-care deficits, and 0.84 for the knowledge and practice domain, indicating acceptable reliability ($\alpha \geq 0.70$). Test–retest reliability was confirmed through a pilot study conducted at a two-week interval ($r=0.81$), demonstrating stability over time. The questionnaire and educational module were culturally adapted and translated into Pashto using forward to backward translation procedures to ensure linguistic and contextual appropriateness.¹⁶

Data were analyzed using SPSS version 25. Descriptive statistics, including frequencies, percentages, means, and standard deviations, were used to summarize demographic variables. The paired t-test was employed to compare pre- and post-intervention outcomes. A significance level of $P > 0.05$ indicated normal and homogeneous data distribution.

Ethical approval for this study was obtained from the Lincoln University College Ethics Committee, Malaysia, and the Institutional Review Board of the Medical Teaching Institute, Peshawar. Written informed consent was obtained from all participants. Confidentiality and anonymity were ensured throughout data collection and analysis.

Results

The study examined the influence of self-efficacy-based educational intervention on self-care practices among women diagnosed with gestational diabetes mellitus (GDM) in Peshawar, Pakistan, using the theoretical framework of Orem's Self-Care Theory. Data were collected from intervention and control groups through pre- and post-test assessments focusing on knowledge, self-care requisites, and self-care deficits.

At baseline, both groups validated comparable mean scores across all domains, confirming the initial homogeneity of participants. Following the intervention, a notable improvement was observed in the intervention group across several self-care dimensions, particularly in physical activity, balanced diet, sleep adequacy, and stress management, while minimal or no change was noted among control participants. The intervention group also reported enhanced self-efficacy levels and a significant reduction in daily activity-related self-care deficits, reflecting the positive impact of structured self-care education guided by Orem's theory.

Table 1 shows a significant improvement in participants' knowledge and confidence after the intervention.

For confidence in managing health, the mean decreased from 3.00 to 1.70 ($P < 0.001$), indicating a clear rise in confidence, as lower scores represent stronger self-belief.

For belief in knowledge and skills, the mean dropped from 2.02 to 1.57 ($P<0.001$), showing that participants felt more capable of maintaining their health following the intervention. Responses to seeking reliable health information, the mean declined from 2.68 to 1.42 ($P<0.001$), suggesting that participants became more proactive in obtaining credible health information. These results confirm that the intervention effectively enhanced self-efficacy, awareness, and engagement in self-care practices, consistent with Orem’s Self-Care Theory, which emphasizes the role of knowledge and confidence in improving self-care behavior.

The Table 2 and Figure 1 present the comparative analysis of self-care requisites between the experimental and control groups before and after the intervention. The results reveal a clear and statistically significant improvement in the case group across all four self-care behaviors ($P<0.001$). Specifically, participants in the case group reported greater frequency of physical

activity (mean difference = 1.70), improved dietary habits (1.42), better sleep patterns (1.51), and enhanced stress management (1.19) following the intervention.

My comparison, the control group showed minimal changes in mean scores between pre- and post-tests, none of which reached statistical significance ($P>0.05$). This pattern indicates that the intervention had a substantial positive impact on the experimental participants’ self-care practices, while the control group remained largely unchanged. The findings suggest that structured health education and behavioral support effectively enhanced self-care behaviors among the intervention participants.

The effects in Table 3 express that the intervention group demonstrated a modest yet meaningful reduction in self-care deficits following the educational intervention based on Orem’s Self-Care Theory. Specifically, the mean score for difficulty in managing daily activities decreased significantly from 1.57 to 1.40 ($P=0.040$), indicating that participants became more capable of performing

Table 1. Effect of Intervention on Knowledge Improvement among Case and Control Groups

Variable (Knowledge Item)	Group	Pre-test Mean ± SD	Post-test Mean ± SD	Mean Difference	P-value
How confident are you in your ability to manage your own health?	Control (n = 110)	3.02 ± 1.31	2.91 ± 1.28	0.11	0.412
	Case (n = 110)	3.00 ± 1.35	1.70 ± 1.14	1.30	0.000
Do you believe you have the knowledge and skills to maintain your health?	Control (n = 110)	2.01 ± 0.73	1.96 ± 0.74	0.05	0.543
	Case (n = 110)	2.02 ± 0.74	1.57 ± 1.10	0.45	0.000
How often do you seek health information from reliable sources?	Control (n = 110)	2.70 ± 1.28	2.66 ± 1.25	0.04	0.611
	Case (n = 110)	2.68 ± 1.30	1.42 ± 1.11	1.26	0.000

Table 2. Comparison of Pre- and Post-Test Mean Scores on Self-Care Requisite Behaviors among Case and Control Groups

Self-Care Requisite Items	Group	Pre-test Mean	Post-test Mean	Mean Difference	P-value
How often do you engage in physical activity?	Case	2.95	1.25	1.70	0.000
	Control	2.98	2.89	0.09	0.214
How often do you consume a balanced diet?	Case	3.00	1.58	1.42	0.000
	Control	2.96	2.81	0.15	0.153
How often do you get enough sleep?	Case	3.12	1.61	1.51	0.000
	Control	3.09	2.93	0.16	0.167
How often do you manage stress effectively?	Case	2.54	1.35	1.19	0.000
	Control	2.57	2.44	0.13	0.189

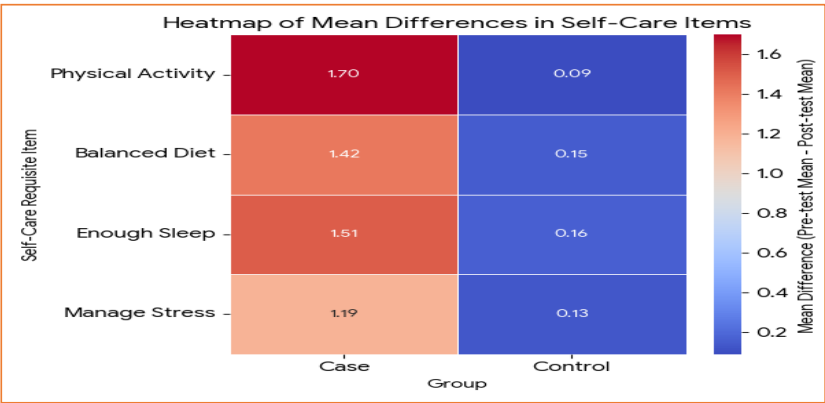


Figure 1. Heatmap of mean differences in self-care items

Table 3. Comparison of Pre-test and Post-test Mean Scores of Self-Care Deficit Variables Between Control and Intervention Groups

Self-Care Deficit Variable	Control Group (n = 110)		Intervention Group (n = 110)		t	P-value
	Pre-test Mean	Post-test Mean	Pre-test Mean	Post-test Mean		
Difficulty in maintaining personal hygiene	1.70	1.71	1.72	1.69	0.115	0.908
Difficulty in managing daily activities	1.55	1.54	1.57	1.40	2.067	0.040*
Lack of motivation for self-care	1.56	1.57	1.58	1.51	0.729	0.467
Dependence on others for health needs	1.50	1.51	1.50	1.49	-0.055	0.956

*P-value < 0.05.

their daily health-related tasks independently. This improvement suggests that enhancing self-efficacy through structured self-care education effectively reduced functional dependency among women with gestational diabetes.

Conversely, no statistically significant changes were observed in other deficit domains, such as maintaining personal hygiene, motivation for self-care, or dependence on others ($P > 0.05$). These findings may reflect the persistence of certain psychosocial or contextual barriers that require longer intervention exposure or individualized support.

Generally, the analysis supports the partial effectiveness of the intervention in reducing specific self-care deficits. The results underscore the importance of targeted educational components emphasizing daily activity management within the broader framework of Orem's Self-Care Theory for improving self-management outcomes among women with gestational diabetes.

Discussion

This study evaluated the impact of a self-efficacy-based educational intervention, directed by Orem's Self-Care Theory, on self-care practices among women with gestational diabetes in Peshawar, Pakistan. The intervention led to significant post-test improvements in several self-care areas, including personal hygiene, dietary management, physical activity, stress control, and sleep regulation, among the intervention group compared with controls. These results demonstrate that enhancing self-efficacy effectively improves self-care performance, consistent with Orem's framework of promoting self-care agency through supportive education.^{11,16,17}

The present results align with previous research indicating that higher self-efficacy contributes to better diabetes self-management outcomes.^{1,2,14} Evidence from meta-analyses and systematic reviews also confirms that structured self-management education significantly enhances adherence to diabetic care behaviors, particularly when interventions emphasize patient confidence and motivation.^{1,3,4,18} Similar trends have been reported in low- and middle-income countries, where educational interventions improved self-care adherence despite limited health literacy.^{1,15,19}

In this study, Orem's theoretical model served as a practical tool linking self-efficacy to behavioral change. By empowering participants with self-care knowledge and reinforcing self-belief, the intervention reduced self-

care deficits and improved perceived control over disease management outcomes consistent with prior studies applying theory-based self-management programs in gestational diabetes.^{10,12,16} These findings further support the role of structured, culturally contextualized education as an essential component of antenatal care for women with gestational diabetes.^{7,8,9,13}

Conversely, the control group showed little improvement, suggesting that conventional clinical counseling alone may be insufficient to induce sustainable behavioral change.^{5,6,12} This pattern aligns with earlier research demonstrating that unstructured health communication rarely influences maternal self-care behaviors.^{13,15}

The findings provide empirical support for integrating Orem-based, self-efficacy-enhancing interventions into maternal health programs in Pakistan. Such interventions are feasible, theory-driven, and capable of fostering long-term self-management and psychosocial well-being among women with gestational diabetes.^{9,16,17}

Conclusion

The study confirmed that self-efficacy plays a pivotal role in improving self-care practices among women with gestational diabetes. The application of Orem's Self-Care Theory provided an effective framework for designing and implementing an intervention that significantly enhanced participants' knowledge, confidence, and daily self-management behaviors. Women who received the intervention showed substantial improvements in physical activity, dietary regulation, stress management, and self-care maintenance compared to the control group, underscoring the value of structured, theory-based education.

The results highlight evidence from prior research that empowering patients through self-efficacy-oriented methods leads to better adherence and long-term self-management outcomes.^{1,2,4,14,18} Additionally, this study highlights the need to integrate patient-centered educational programs within antenatal care settings, particularly in resource-limited contexts such as Pakistan, where awareness and support for gestational diabetes remain limited.

Future plans should emphasize sustained follow-up, inclusion of family support, and culturally adapted materials to enhance the continuity of self-care behaviors beyond pregnancy. Strengthening self-efficacy through tailored nursing interventions, as advocated by Orem's

model, can thus contribute meaningfully to improving maternal health outcomes and reducing diabetes-related complications.

Authors' Contribution

Conceptualization: Riffat Shoukat, Hafizah Che Hassan.

Data Curation: Riffat Shoukat.

Formal Analysis: Riffat Shoukat, Fazia Ghaffar.

Investigation: Riffat Shoukat.

Methodology: Riffat Shoukat, Hafizah Che Hassan.

Supervision: Hafizah Che Hassan.

Writing–Original Draft: Riffat Shoukat.

Writing–Review & Editing: Hafizah Che Hassan, Fazia Ghaffar.

Competing Interests

The authors declare that they have no competing interests.

Ethical Approval

Ethical approval for this study was obtained from the Lincoln University College Ethics Committee, Malaysia, and the Institutional Review Board of the Medical Teaching Institute, Peshawar (Ethics Code: LUC/MKT/IND/SP/03/739).

Funding

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

References

1. Aburayyan L, Ozturk C. Effect of Orem's Self-Care Model on self-efficacy, self-management, quality of life, and HbA1c among children with type 1 diabetes mellitus in Palestine. *BMC Med Educ* 2026;26(1):539. doi:10.1186/s12909-025-08520-w
2. Bohanny W, Wu SF, Liu CY, Yeh SH, Tsay SL, Wang TJ. Health literacy, self-efficacy, and self-care behaviors in patients with type 2 diabetes mellitus. *J Am Assoc Nurse Pract* 2013;25(9):495-502. doi:10.1111/1745-7599.12017
3. Octavianti DP. Literature Review: Pengaruh Edukasi Self-Management Diabetes Terhadap Self-Efficacy Pada Penderita Diabetes Mellitus. *Jurnal Genta Kebidanan* 2020;10(1):38-47. doi:10.36049/jgk.v10i1.20
4. Chrvala CA, Sherr D, Lipman RD. Diabetes self-management education for adults with type 2 diabetes mellitus: a systematic review of the effect on glycemic control. *Patient Educ Couns* 2016;99(6):926-43. doi:10.1016/j.pec.2015.11.003
5. Mohebi S, Azadbakht L, Feizi A, Sharifirad G, Kargar M. Review the key role of self-efficacy in diabetes care. *J Educ Health Promot* 2013;2:36. doi:10.4103/2277-9531.115827
6. Bandura A. Self-efficacy: toward a unifying theory of behavioral change. *Psychol Rev* 1977;84(2):191-215. doi:10.1037//0033-295x.84.2.191
7. Orem DE. *Nursing: Concepts of practice*. 6th ed. St. Louis: Mosby; 2001.
8. Shrivastava SR, Shrivastava PS, Ramasamy J. Role of self-care in management of diabetes mellitus. *J Diabetes Metab Disord* 2013;12(1):14. doi:10.1186/2251-6581-12-14
9. Paulsamy P, Ashraf R, Alshahrani SH, Periannan K, Qureshi AA, Venkatesan K, et al. Social support, self-care behaviour and self-efficacy in patients with type 2 diabetes during the COVID-19 pandemic: a cross-sectional study. *Healthcare (Basel)* 2021;9(11):1607. doi:10.3390/healthcare9111607
10. Jawad F, Ejaz K. Gestational diabetes mellitus in South Asia: epidemiology. *J Pak Med Assoc* 2016;66(9 Suppl 1):S5-7.
11. Azmat S, Sajjad N, Asghar S, Ahmed K, Anwar M, Ishaq HA. Knowledge of gestational diabetes mellitus among diabetic pregnant females: knowledge of gestational diabetes mellitus. *Pak J Health Sci* 2024;5(6):129-33. doi:10.54393/pjhs.v5i06.1789
12. Eshete A, Lembebo A, Getacher L, Kifle-yohans T, Assefa Y, Mphuthi DD. Barriers to diabetes self-management in the North Shoa zone, Ethiopia: a qualitative study with patients and healthcare providers. *BMC Public Health* 2026;26(1):938. doi:10.1186/s12889-026-26621-z
13. Ernawati U, Wihastuti TA, Utami YW. Effectiveness of diabetes self-management education (DSME) in type 2 diabetes mellitus (T2DM) patients: systematic literature review. *J Public Health Res* 2021;10(2):2240. doi:10.4081/jphr.2021.2240
14. Sarkar U, Fisher L, Schillinger D. Is self-efficacy associated with diabetes self-management across race/ethnicity and health literacy? *Diabetes Care* 2006;29(4):823-9. doi:10.2337/diacare.29.04.06.dc05-1615
15. Wang Y, Zhu W, Pu Y, Wang Y, Luo B. Barriers and enablers in the implementation of physical activity improvement for pregnant women with gestational diabetes mellitus: a mixed-methods study. *J Adv Nurs* 2025;81(11):7868-81. doi:10.1111/jan.16720
16. Babak A, Golshiri P, Farasatkish S. Effect of self-efficacy-based training on metabolic control of patients with type 2 diabetes. *Int J Physiol Pathophysiol Pharmacol* 2022;14(5):281-8.
17. Jandaghian Bidgoli M, Jamalnia S, Pashmforosh M, Shaterian N, Darabiyan P, Rafi A. The effect of Orem self-care model on the improvement of symptoms and quality of life in patients with diabetes: a scoping review. *Invest Educ Enferm* 2024;42(1):e80. doi:10.17533/udea.iee.v42n1e08
18. Sushko K, Menezes HT, Strachan P, Butt M, Sherifali D. Self-management education among women with pre-existing diabetes in pregnancy: a scoping review. *Int J Nurs Stud* 2021;117:103883. doi:10.1016/j.ijnurstu.2021.103883
19. Tümkaya MN, Eroğlu K, Karaçam Z. The effect of Orem's Self-Care Deficit Theory-based care during pregnancy and postpartum period on health outcomes: a systematic review and meta-analysis. *Int J Nurs Pract* 2024;30(6):e13300. doi:10.1111/ijn.13300