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Examining Gestational Diabetes Mellitus Educational Resources: Patient and Provider Perspectives

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Abstract

Objective: To analyze the effectiveness of gestational diabetes mellitus (GDM) education as well as patient and provider confidence in education practices.

Study Design: Women with a diagnosis of GDM who delivered at Miami Valley Hospital were included in the study. Patients were asked to complete a questionnaire to evaluate their knowledge and confidence in managing their GDM. Providers were asked to complete a questionnaire to provide their perspective on patient education related to GDM.

Results: Patients correctly identified 66% of the correct ways that GDM affects maternal health, fetal health, and pregnancy complications. Patients felt empowered by their education and were confident in their understanding and ability to manage their GDM. Providers rated their perception of current patient education, comprehension, and confidence to be good/average.

Conclusion: We did not identify any deficiencies in patient knowledge about gestational diabetes. Patients felt more confident about current patient education practices than providers. These findings suggest that prenatal education for GDM is effective for patients.

Introduction

An estimated 6-9% of pregnancies in the United States are complicated by diabetes with 90% of those pregnancies presenting with Gestational Diabetes Mellitus (GDM) and the remainder from pre-existing diabetes.[1] Patients with GDM are more likely to develop preeclampsia, undergo a cesarean delivery, and have 7 times the risk of developing type 2 diabetes later in life compared to women with normal glucose tolerance in pregnancy.[2] The offspring of women with GDM are at an increased risk of macrosomia, preterm birth, shoulder dystocia, neonatal hypoglycemia, hyperbilirubinemia, respiratory distress, and potential stillbirth.[2] However, the use of appropriate lifestyle interventions in diet, exercise, and medications with comprehensive patient education on the risks, complications, and management of gestational diabetes can improve patient outcomes.[3]

Health literacy plays an important role in the management of patients with GDM. Poor health literacy is associated with poor glycemic control and less understanding of personal illness and treatment options.[4] Health literacy is affected by cognitive reading and reasoning ability, language, culture and religion, socioeconomic and environmental factors (neighborhood conditions), access to medical care and previous medical experience.[4] Current models of education for patients with GDM often include lengthy brochures and pamphlets containing technical language written at advanced reading levels.[2] For this reason, providers must

understand and address the barriers patients face regarding knowledge of their condition and confidence in their ability to manage their condition as part of the education process. Studies suggest that education models based in prioritizing patient health goals alongside written, easy-to-understand materials can improve patient knowledge and outcomes.[5,6] This has been shown to play a critical role in improving the understanding of GDM, dietary habits, physical activity, blood-glucose self-monitoring, and prevention of complications and are an important way providers can improve communication with patients with poor health literacy.[6]

Comprehensive and accessible education plays a foundational role in the treatment of GDM. Our aim is to examine the current level of effectiveness in providing patient education by having patients rate their understanding and satisfaction with current practices. Additionally, we aim to assess provider beliefs about the adequacy of our current protocol for GDM education and their perception of their patients' confidence and knowledge.

Methods

This study focused on patient knowledge and confidence in the management of GDM. This was assessed among pregnant patients with a diagnosis of gestational diabetes mellitus (diabetes diagnosed in pregnancy) who delivered at Miami Valley Hospital. For the purpose of this study, patients who did not speak or understand English were excluded. Those who qualified for the study were asked to complete a Patient Questionnaire (Appendix 1) which evaluated their knowledge of GDM. Providers on the OB/GYN Staff Service filled out a Provider Questionnaire (Appendix 2) to assess their perspective on current patient education for GDM.

The researchers reviewed the current education protocol for patients with diabetes in pregnancy. Questionnaires were provided to patients after delivery at Miami Valley Hospital. The questionnaire were completed anonymously. Thirty-eight patients completed the survey in the 12-month data collection timeframe. Questionnaires were scored based on the number of answers that were correctly marked for patient knowledge questions (questions 2-4). An average score for patient confidence ratings (questions 8-10) was calculated. Physicians completed the Provider Questionnaire (Appendix 2) at a provider meeting. Data were entered in RedCap.[7]

Results

Thirty-eight patients participated in the study. The most frequent educational backgrounds reported by patients were graduated high school (31.6%) and graduated with a bachelor's degree or higher (42.1%) (Table 1). The majority of patients reported that they managed their gestational diabetes through dietary changes (92.1%). More than half of the patients managed their condition with exercise (52.6%) and medications with metformin, glyburide, and insulin (52.6%).

Table 1: Demographics		
Demographic	**Category**	**Patient Response [n (%)]**
Education	High school	12 (31.6%)
	Bachelors	16 (42.1%)
Management	Diet	35 (92.1%)
	Exercise	20 (52.6%)
	Medications	20 (52.6%)

Patients reported few barriers to care. Table 2 shows patient reported barriers for adhering to their management protocol. The most common barrier patients identified was not having time to exercise (10.5%). Overall patients had little concern with their management, with 27.6% of respondents offering improvements. These improvements included more thorough diet education, following-up with a dietician, more communication, more consistency with provider, more education on risks of GDM, and more physical handouts to review.

Table 2: Barriers to Care	
Barrier	**Patient Response [n (%)]**
Dieting too challenging	2 (5.3%)
Don't have time to exercise	4 (10.5%)
Haven't been given resources	2 (5.3%)
Not listened to by provider	1 (2.6%)

Patient knowledge was evaluated using multi-select multiple choice questions. Patients were instructed to check all items they believed were impacted by having diabetes for their health and their baby's health (Table 3). Common items that patients did not mark were bone and joint problems and blood vessel damage with only 47.4% correctly identifying these health conditions. Few patients identified skeletal defects as a consequence of GDM on fetal health with only 26.3% correctly marking this item. Fewer patients marked postpartum heavy bleeding as a complication of GDM with only 42.1% of patients correctly identifying this item.

Table 3: Assessment of Patient Knowledge		
	Patients marking item as Correct [n (%)]	**Mean number of items marked as Correct [mean (SD)]**
How diabetes can impact your health (max score=7)		4.5 (2.4)
Increased risk heart disease	28 (73.7%)	
Increased risk stroke	24 (63.2%)	
Increased risk high blood pressure	33 (86.8%)	
Bone and joint problems	18 (47.4%)	
Blood vessel damage	18 (47.4%)	
Nerve damage	24 (63.2%)	
Increased risk infection	25 (65.8%)	
How diabetes can impact your baby's health (max score=8)		5.1 (1.5)
Cardiac defects	18 (47.4%)	
Skeletal defects	10 (26.3%)	
Increased chance of genetic problem (unchecked)	28 (73.7%)	
Low blood sugar	35 (92.1%)	
High birth weight	36 (94.7%)	
Jaundice	23 (60.5%)	
Birth trauma	21 (55.3%)	
Stillbirth	18 (63.2%)	
Other complications (max score=5)		3.5 (.90)
Preeclampsia	29 (76.3%)	
Increased likelihood of c-section	27 (71.1%)	
Postpartum heavy bleeding	16 (42.1%)	
Diabetes later in life/future pregnancy	34 (89.5%)	
Issues with breastfeeding (unchecked)	26 (68.4%)	

Patients were asked how they felt about their knowledge (Table 4). Overall, patients reported a high level of confidence and empowerment based on their knowledge on a scale of 0 (not at all) to 5 (very). Patients reported a high level of empowerment to follow the suggestions given by their healthcare providers to better control their blood sugar (4.5±0.7). Patients reported feeling confident in their understanding of their condition (4.4±0.9), and patients reported feeling confident in their ability to manage their condition. (4.5±0.6).

Table 4: Patient Perspectives of Knowledge	
	6-Point Scale [mean (SD)]
Empowerment follow provider suggestions	4.5 (0.7)
Confidence in understanding condition	4.4 (0.9)
Confidence in managing condition	4.5 (0.6)

Resident physicians evaluated the quality of their current patient education practices on a 0-5 scale (0=poor, 5= excellent) (Table 5). Providers had a neutral perception of current patient education, not poor but not excellent (2.7±0.9). Providers scores on their perception of patient comprehension of their condition were in the average range (2.6±0.7). Providers also reported an average rating of patient confidence following education (2.7±0.7). Time spent providing of education was about 30 minutes (31.3±14.8).

Table 5: Physician Perspectives of Education	
	6-Point Scale (SD)*
Current Patient Education	2.7 (0.9)
Patient Comprehension	2.6 (0.7)
Patient Confidence	2.7 (0.7)
* 0-5 scale from 0=poor to 5=excellent	

Conclusion

The aim of this study was to assess the efficacy of gestational diabetes mellitus (GDM) education and its impact on both patient and provider confidence in educational practices. We found that patients demonstrated a proficient knowledge of the majority of GDM's effects on maternal health, fetal health, and pregnancy complications. The education patients received empowered them and bolstered their assurance in comprehending and effectively managing their GDM. These findings support that current GDM education is satisfactory based on patients' knowledge. However, providers rated current patient education practices, patients' grasp of the subject matter, and overall confidence as average indicating they believe there is room for improvement.

Certain limitations did surface in the course of this study. Notably, patients who lacked proficiency in the English language were excluded. Expanding educational research to include non-English speaking participants could be one avenue for future exploration. Additionally, it is plausible that physicians might underestimate patient satisfaction and knowledge levels due in part to the shared responsibility of patient education between physicians and nutritionists. Increasing interdepartmental communication could further increase provider satisfaction with patient education.

This project demonstrated that patients with a variety of educational backgrounds are receiving effective education about GDM and that patients are satisfied with their education. However, this study also demonstrated that there is room for improvement in patient education to ensure that all areas where GDM could impact health are clear for patients. Furthermore, physician confidence in patient education is an area for continued development. Good health and pregnancy outcomes begin with comprehensive education that instills patient confidence. By using patient-centered educational practices in conjunction with appropriate interventions, physicians can help those with GDM achieve a happier, healthier pregnancy.

References

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Appendix 1: Patient Questionnaire

You are being invited to participate in a research study by completing a questionnaire about diabetes before and during pregnancy. There are no known risks for your participation in this research study. The information collected may not benefit you directly. The information you provide will be used to improve current patient education practices. Your completed survey will be securely stored at the Five Rivers Health Center office. The survey will take approximately 5-10 minutes to complete.

Please note that there are no right or wrong answers. This is an assessment of the effectiveness of the educational interventions we provide. The answers you write here will NOT affect your healthcare in any way. Questions should be answered without any outside resources or help.

Today's Date: _____

1. Highest level of education? (circle one)

- Less than high school
- Some high school
- GED or high school diploma
- Some college
- Bachelor's degree
- Master's degree
- Doctoral degree
- Not otherwise specified: _____

2. How can diabetes impact your health? (circle all that apply)

- Increased risk of heart disease
- Increased risk of stroke
- Increased risk for high blood pressure
- Bone and joint problems
- Blood vessel damage
- Nerve damage
- Increased risk of infection

3. How can diabetes impact the health of your baby (circle all that apply)?

- Cardiac defects
- Skeletal defects
- Increased chance of genetic problem (i.e. Down syndrome)
- Low blood sugar
- High birth weight
- Jaundice
- Birth trauma
- Stillbirth

4. What other pregnancy related complications are associated with your diagnosis? (circle all that apply)

- Risk of developing pre-eclampsia (high blood pressure with end organ damage)
- Increased likelihood of c-section delivery
- Postpartum heavy bleeding
- Risk of developing diabetes later in life or in future pregnancies
- Issues with breastfeeding

5. How have you been managing your condition? (circle all that apply)

- Changes to my diet
- Regular exercise
- With medication – if so, which ones?
    - Insulin
    - Metformin
    - Glyburide
    - Other: _____
    - Other lifestyle changes, please specify

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6. Are there any barriers or challenges you face to ensuring your diabetes is well managed (blood sugars are within your goal)? Yes/No

- If yes, please specify (circle all that apply):
    - Dieting is too challenging
    - I don't have time and/or energy to exercise
    - I haven't been given the resources I need to succeed
    - My medication doses are wrong
    - I feel like I am not listened to by my healthcare provider
    - I'm not sure
    - Other: _____

7.What could we be doing better in this clinic to help manage your condition?

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8. On a scale of 0-5 how *empowered* do you feel to follow the suggestions given by your healthcare providers to better control your blood sugars? (circle one)

0 (not at all) 1 2 3 4 5(very)

9. On a scale of 0-5 how confident do you feel about your *understanding* of your condition? (circle one)

0 (not at all) 1 2 3 4 5(very)

10. On a scale of 0-5 how confident do you feel about your *ability* to manage your condition? (circle one)

0 (not at all) 1 2 3 4 5(very)

THANK YOU!

Appendix 2: Provider Survey

How would you rate the current patient education protocol for patients with gestational diabetes mellitus?

0 (needs improvement) 1 2 3 4 5 (excellent)

How would you rate your patients' level of comprehension after education is complete?

0 (minimal) 1 2 3 4 5 (very high)

How would you rate your patients' level of confidence after education is complete?

0 (minimal) 1 2 3 4 5 (very high)

On average how long does educating patients with gestational diabetes take? _____ minutes