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EXAMINING REASONS FOR LOW FIDELITY TO EDUCATIONAL PROGRAMS IN PATIENTS WITH GESTATIONAL DIABETES: A QUALITATIVE STUDY

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EXAMINING REASONS FOR LOW FIDELITY TO EDUCATIONAL PROGRAMS IN
PATIENTS WITH GESTATIONAL DIABETES: A QUALITATIVE STUDY

Thesis

A thesis submitted in partial fulfillment of the
requirements for the degree of Master of Science in the
College of Agriculture, Food, and Environment
at the University of Kentucky

By

Lauren Brinkman Roberson

Lexington, Kentucky

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Lexington, Kentucky 2014

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ABSTRACT OF THESIS

EXAMINING REASONS FOR LOW FIDELITY TO EDUCATIONAL PROGRAMS IN PATIENTS WITH GESTATIONAL DIABETES: A QUALITATIVE STUDY

Gestational diabetes mellitus (GDM) is an increasing problem in the U.S. Many comorbidities are associated with GDM: increased risk for type 2 diabetes, neonatal hypoglycemia and fetal malformation. Healthcare organizations develop GDM educational programs to provide women with knowledge and skills to manage GDM and reduce health risks. While there are significant benefits to attending GDM educational programs, attendance rates are low. Little research has been conducted to determine reasons for low attendance in GDM educational programs. The purpose of this study was to explore the experiences of women with GDM and to describe factors influencing GDM educational program attendance. Semi-structured telephone interviews were conducted with GDM program participants at a large hospital in central Kentucky. The sample size was $N=21$. Results indicated that meal management changes and blood glucose monitoring characterized the GDM experience and many attended the educational program to receive information on these topics. Few participants reported barriers to attendance. The majority was satisfied with information received. Motivators to attendance included flexibility, location, and support of family members.. Participants preferred face-to-face meetings although some expressed a need for online classes and communication via text messaging. Participants expressed the need for GDM information postpartum.

Keywords: gestational diabetes mellitus, gestational diabetes educational programs, attendance, diabetes educators, qualitative research

Lauren Brinkman Roberson

April 21st, 2014

EXAMINING REASONS FOR LOW FIDELITY TO EDUCATIONAL PROGRAMS
IN PATIENTS WITH GESTATIONAL DIABETES: A QUALITATIVE STUDY

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April 21st, 2014
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DEDICATIONS

To my husband,

James Allen Roberson

For giving me the strength and the confidence to make my dreams come true

&

My parents, Gary and Lisa Brinkman

&

My siblings, Abby and Nick Brinkman

For the love and support that has gotten me where I am today

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Chapter One - Introduction

Gestational diabetes mellitus (GDM) is defined as insulin resistance, or an intolerance to carbohydrates that is first identified and/or is initiated during pregnancy (Cheung, 2009). Gestational diabetes affected 143 million women nationally in 2010 (Hirst, Tran, T Do, Forsyth, Morris, & Jeffrey, 2012; International Diabetes Federation, 2012). This number is projected to rise to 222 million by the year 2030. Approximately 1 in 25 pregnancies globally is complicated by this condition making the identification and treatment of GDM a national and global priority.

Factors such as obesity, family history of diabetes, large for gestational age of baby in previous pregnancy, polycystic ovarian syndrome (PCOS), and age 35 or greater predispose a woman to the development of GDM (Hui-Xia, 2012). An infant is categorized as large for gestational age if his/her birth weight is above the 90th percentile on the intrauterine growth chart (Mahan, Escott-Stump & Raymond, 2012). The Committee on Obstetric Practice (2011) guidelines for screening and diagnosis of GDM states all pregnant women should be screened for GDM during the 24th -28th week of gestation using a 50g, 1-hour loading test to evaluate blood glucose levels. If blood glucose (BG) levels warrant, a 100g, 3-hour oral glucose tolerance test (OGTT) may be performed to confirm diagnosis. This test should be performed if patient history and risk factors are not sufficient to indicate blood glucose levels. At least two or more thresholds must be met in order for a positive diagnosis to be made. See Table 1.1 below for serum values.

Table 1.1 Gestational Diabetes Diagnostic Criteria: Oral Glucose Tolerance Test

Table 1. Diagnostic Criteria for the 100-g, 3-Hour Tolerance Test for Gestational Diabetes Mellitus*

Status	Plasma or Serum Glucose Level		Plasma Level	
	Carpenter and Coustan Conversion		National Diabetes Data Group Conversion	
	(mg/dL)	(mmol/L)	(mg/dL)	(mmol/L)
Fasting	95	5.3	105	5.8
1 hour	180	10.0	190	10.6
2 hours	155	8.6	165	9.2
3 hours	140	7.8	145	8.0

Source: The American College of Obstetricians and Gynecologists, 2011

Gestational diabetes can lead to a wide variety of adverse pregnancy outcomes for both mother and baby. Complications for the mother include an increased risk for type 2 diabetes, atherosclerosis, coronary artery disease and hypertension (Stasenko, Liddell, Cheung, Sparks, Killion, and Caughey, 2011). Other negative consequences include heart attack, kidney disease, stroke, peripheral neuropathy, blindness, caesarean section and higher healthcare costs associated with this procedure (Zazworsky, Bolin, and Gaubeca, 2006). The baby also experiences complications such as neonatal hypoglycemia, jaundice, respiratory distress, increased likelihood of fetal malformation and perinatal mortality (Cheung, 2009).

Educational programs for women with GDM generally include counseling on screening for type 2 diabetes, long term effects of GDM, and nutrition and physical activity recommendations. Specific benefits of educational programs include return for follow-up care with a primary and/or secondary care provider, reduced incidence of congenital malformations, decreased complications during pregnancy, improved hemoglobin A1C levels, and maintenance of recommended weight gain during pregnancy

(Anwar et al., 2011; Stasenko et al., 2011). Women with GDM who attend educational programs also become more aware of their condition and the impact of diet, guidelines for monitoring blood glucose, and importance of exercise on the development and management of GDM. They also receive the support, knowledge and care they need to control their blood glucose and minimize adverse outcomes.

Despite the benefits of GDM educational programs, attendance tends to be low. Women with GDM are offered these educational programs to help manage their condition, but many do not take advantage of them. Pierce et al (2011) estimated the attendance rates at educational programs conducted by secondary providers to be between 38-54 percent in the United States. Secondary providers are nurses, diabetes educators, registered dietitians, etc. that support the care given by primary providers, or physicians. Local educational program attendance rates are comparable at Baptist Health Hospital in Lexington, Kentucky at approximately 40 percent (K. Stanley, personal communication, 2012).

The majority of studies regarding GDM to-date have focused on the feelings of women concerning their GDM diagnosis. Many of these studies revealed that women are motivated to make the necessary changes to ensure the health of their baby, but do not have the resources and support to manage their condition (Hirst et al., 2012). Few studies have focused on the reasons for low-fidelity and what can be done to encourage higher participation in educational programs for women with GDM. This study attempts to fill the gap in the extant literature.

The purpose of the present study was to explore the experiences of women with GDM and to describe factors (i.e. reasons for attending, barriers, motivators, class format and support) influencing GDM educational program attendance.

Objectives

1. Investigate experiences of women with gestational diabetes who attend the GDM educational program at a mid-sized hospital in Lexington, Kentucky.
2. Identify barriers associated with low-fidelity to GDM educational programs at a mid-sized hospital in Lexington, Kentucky.
3. Identify what motivates women to attend GDM educational programs at a mid-sized hospital in Lexington, Kentucky.
4. Identify ways of increasing attendance at educational programs at a mid-sized hospital in Lexington, Kentucky.

Assumptions

Women will be motivated to participate and share their experiences regarding treatment of their GDM, perceptions of GDM educational programs at the same mid-sized hospital in Lexington, Kentucky, and that responses they provide will be accurate and true. It is also assumed that healthcare professionals involved in the treatment/management of GDM will be receptive to suggestions for improving educational programs for women with GDM.

Chapter Two - Literature Review

This review summarizes the literature on gestational diabetes and the reasons for low-fidelity to educational programs among women with GDM. It focuses on six main areas that serve as a foundation for this current study: (1) prevalence of gestational diabetes, (2) attitudes and opinions associated with GDM diagnosis, (3) barriers/facilitators to treatment, (4) costs, (5) providers' experience in caring for women with GDM and (6) support for medical nutrition therapy (MNT) and counseling.

Prevalence of Gestational Diabetes

Cheung (2009) defines GDM as carbohydrate intolerance that occurs as a result of pregnancy and/or is first identified in pregnancy. In essence, the mother is unable to break down carbohydrates adequately and develops high blood glucose. Prevalence rates range anywhere from three to seven percent for diabetes during pregnancy (Nolan et al., 2010). Consequently, GDM develops in one of 25 pregnancies (Hirst et al., 2012). Prevalence of GDM depends strongly on ethnic background with higher rates found in Asian, Hispanic, Native American and African American women compared to Caucasians (Stasenko et al., 2011). Factors such as obesity, family history of type 2 diabetes, GDM history, previously giving birth to a large for gestational age (LGA) infant, polycystic ovarian syndrome (PCOS), recurrent positive glycosuria, age 35 or greater and an impaired glucose tolerance increase a woman's risk for developing GDM (Hui-xia, 2012).

Attitudes and Opinions Associated with GDM Diagnosis

Several authors have used the qualitative paradigm to examine the mother's experiences with GDM. Nolan et al (2010) conducted focus groups and phone interviews

with eight women with either type 2 diabetes or GDM to observe their experiences. Open-ended questions were posed concerning the women's feelings about their diagnosis, barriers to care, diabetes management, and any concerns about the future. Three themes emerged from their data: (1) feeling concern for the infant and how their condition would affect the baby, (2) feeling concern for their own health and how their GDM would impact it and (3) a sense of loss of personal control over health (Nolan et al., 2010).

Women cross-culturally expressed similar feelings in response to a GDM diagnosis. Hirst et al (2012) used focus groups to examine reasons for low-fidelity to educational programs for management of GDM in Vietnamese women. Results showed that Vietnamese women expressed worry, fear, and anxiety at the time of diagnosis. Areas of worry included: making appropriate dietary changes, blood glucose monitoring (due to a fear of using needles), and fear that GDM could be passed on to their child via breastfeeding. In addition, these women were extremely concerned about the effect of GDM on the baby (i.e. preterm delivery, stunted growth, and stillbirth). Women in the study wanted more detailed recommendations and information pertaining to diet changes and the effect of GDM on the baby. They felt that doctors were too busy so they had to find other, likely less reliable sources of information. Women in this study expressed preference for small group sessions and informative leaflets (Hirst et al., 2012).

Another cross-cultural study, the DAWN Pregnancy Study, was conducted with immigrants and Italian women with GDM to evaluate their feelings regarding GDM and its management (Lapolla et al., 2012). Similar to findings by Nolan et al (2010) and Hirst et al (2012); women in this study also expressed anxiety upon learning of their GDM

diagnosis. Results revealed that 66 percent of women feared the negative consequences for the baby and 28.9 percent worried about potential deformities in the baby. Part of the reason for infrequent BG monitoring was because the women were worried that the insulin might harm their unborn baby. Many drugs can be transferred from the mother to the baby through the placenta. Some women feared that insulin might be one of those drugs that could be carried through to the baby. If this was the case, women were not sure if insulin might affect the development of the baby. This created concerns because the women did not fully understand insulin and its mechanism of action (Marco et al., 2012).

However, unlike the previous two studies by Nolan et al (2010) and Hirst et al (2012), 52 percent of the women in the DAWN Pregnancy Study were fairly optimistic throughout their entire pregnancy, regardless of their diagnosis. In addition, 34 percent of women in this study were satisfied and 60 percent were very satisfied with the quality of care provided by the diabetes centers. Lapolla et al (2012) suggested that better collaboration between gynecologists and diabetes specialists was the best way to improve care for women with GDM.

Barriers/Facilitators to GDM Education

Several barriers and facilitators affecting the ability of women with GDM to attend educational programs are discussed here. Barriers are any factors that may prevent attendance. Facilitators are any factors that make attendance achievable. It is necessary to understand barriers and facilitators in order to increase follow-up visits among women with GDM. This allows women to obtain the necessary treatment and receive valuable support and information regarding their condition.

Nicklas et al (2011) examined perspectives of 25 women with GDM, barriers and facilitators to healthy lifestyle changes postpartum, and intervention approaches that facilitate participation in a postpartum lifestyle intervention program. A mixed methods approach – focus groups and informant phone interviews, were used to help 25 women recall the year after a pregnancy with GDM. Focus groups were analyzed by means of grounded theory and open coding was used to categorize data by themes. Frequency distributions were used to analyze data from informant interviews (Nicklas et al., 2011).

Results showed that 67 percent of women were aware of the risk for developing type 2 diabetes postpartum if they did not change their lifestyle. Barriers to healthy eating included: difficulty shopping for healthy groceries with their children present, time and money constraints, children's food preferences taking precedence over the mother's health needs, and difficulty eating a healthy diet at work. Women reported severe difficulty maintaining a healthy diet at 12 months postpartum. They felt that their children kept them busy, leaving no time to prepare and eat healthy meals (even while nursing). Women also stated that they were sleep-deprived, making it harder to think about and focus on eating healthy (Nicklas et al., 2011).

Facilitators to healthy eating postpartum included nutrition education with secondary providers. The nutrition education included meal planning and distribution of sample menus. Women wanted lists of healthy foods, tips for preparing healthy foods within a short time frame, and grocery shopping tutorials (i.e. learning how to shop the perimeter of the grocery store and purchasing lots of produce, meat and dairy). They felt the registered dietitian was most qualified to help them with healthy eating and to educate them on proper portion sizes. Most women felt that if there were more accountability

(i.e. MD/RD doing weight checks regularly) then they would be more inclined to eat healthier and exercise. Other ways to increase accountability would be to have regularly scheduled BG tests at the MD/RD's office and to log personal food/exercise data online for the RD to see. It was also mentioned that eating healthier would be easier if children were included in meal planning and preparation (Nicklas et al., 2011).

Almost all participants expressed interest in educational programs but stated that compliance was difficult due to time constraints. Women stated they felt judged by their doctors, and mentioned they were more comfortable working with a registered dietitian. An Internet delivered intervention was suggested as opposed to meeting exclusively in groups. All participants reported feeling "very comfortable" with using the Internet. According to participants, a combination of both would be best. Working in conjunction with a lifestyle coach appears to be beneficial as well. A majority of the women expressed the importance of including others as part of the intervention program to provide social support for healthy behavior changes. Inclusion of the spouse, partner, and the entire family would be extremely helpful (Nicklas et al., 2011).

Carolan, Gill, and Steele (2012) explored factors that facilitate and inhibit GDM self-management. A total of 15 participants from a socially deprived area was purposively selected for the study. Semi-structured interviews were conducted via phone or face-to-face and were audio recorded. Data were analyzed using interpretative phenomenology.

Barriers to GDM self-management identified included: time pressures, there was not enough time to become educated on GDM and to make necessary changes before delivery; physical constraints, inability to get adequate exercise due to aches and pains

associated with pregnancy; social constraints or changes would cause disruption to the family and affect social events; and limited comprehension or doubt about one's ability to self-manage the condition. Women saw insulin as an easier option than making dietary and exercise changes. Women in the study felt that they lacked the education and skills necessary to manage their GDM in the limited time left in their pregnancy. They were also concerned about how these changes could be implemented in their everyday lives (Carolan et al., 2012).

Facilitators to GDM self-management included: maximizing the baby's health and best interests, psychological support (from family and health professionals, partners/spouses), and realization that they were responsible for their own care (Carolan et al., 2012). Women were extremely motivated in order to improve the baby's health. They were more likely to comply if they had support at home and if they were made to realize that the outcome of their condition was in their hands. They felt that it was their responsibility to take care of themselves in order to prevent type 2 diabetes in the future.

Collier, Mulholland, Williams, Mersereau, Turay, and Prue (2011) explored barriers to management and postpartum follow-up in women with GDM using focus groups. Several different barriers were identified in this study. For example: (1) financial barriers and difficulties accessing care (i.e. cost of healthcare, medical supplies, and cost of healthy food), (2) barriers to maintaining a healthy diet and exercising (for African Americans and Hispanics cultural issues made eating healthy difficult), (3) communication difficulties (with healthcare providers), (4) lack of social support, and (5) barriers related to diabetes care (increased time and effort needed to monitor BG and the reluctance to inject insulin [Collier et al., 2011]).

Bennett et al (2011) also examined barriers and facilitators to postpartum follow-up care in women with GDM. Twenty-two women with GDM in their third trimester were recruited for the study. Themes were divided into barriers and facilitators of postpartum follow-up care. Barriers included: (1) dealing with the health issues of a new baby (the positive/negative impact of the delivery experience), (2) personal and family adjustment to a new baby (emotional stress/demands and less time for self-care), (3) concerns about postpartum and future health (women feared a type 2 diagnosis in the future, but believed themselves to be healthy and rid of GDM after delivery) and (4) experiences with medical care and services (long waits in the doctor's office, MD's office not screening for type 2 diabetes, and frustration with providers in general [Bennett et al., 2011]).

Facilitators to postpartum follow-up care included: (1) availability of childcare at time of appointment, (2) need for check-up and clearance to return to work, (3) support and connection with clinical office staff, and (4) discussion on family planning. According to Bennett et al (2011) these results provide an “understudied window into the lives of women with GDM in the postpartum period to better understand their experiences and to identify specific reasons why they did not follow recommendations to return for postpartum follow-up care (Discussion section, p. 243).” It was suggested that future studies need strategies to improve postpartum management of mood symptoms. Consensus exists among the studies discussed (Nicklas et al., 2011; Carolan et al., 2012; Collier et al., 2011 & Bennett et al., 2011) that understanding the barriers and facilitators to GDM management and postpartum follow-up care are important to follow-up care.

Costs

A confirmed GDM diagnosis is associated with a significant increase in total healthcare costs (Kolu, Raitanen, Rissanen, & Luoto, 2012). GDM accounts for a significant economic burden (Chen, Quick, Yang, Zhang, Baldwin, Moran, Moore, Sahai & Dall, 2009). Chen and colleagues (2009) studied national healthcare costs associated with GDM in 2007 and found that as a result of GDM, expenses for each pregnancy increase by \$3,305 with an additional \$209 in expenses for the newborn in the first year. Kolu et al (2012) also analyzed the healthcare costs associated with GDM and women at high risk for GDM during pregnancy. They found that outpatient visits to primary and secondary care providers, prescriptions (i.e. insulin usage), delivery costs, hospital inpatient days before and after delivery, emergency visits and potential stay in the neonatal intensive care unit (NICU) for the newborn, contribute to increased healthcare costs (Chen et al, 2009 & Kolu et al, 2012). GDM also increased the rates of inpatient hospital stay for caesarean delivery, preeclampsia, eclampsia, and hypertension – all of which are adverse pregnancy outcomes. When a caesarean delivery is associated with GDM, inpatient days increase by 19.5 percent. Voluntary and emergency caesarean sections occurred 21.1 percent of the time in women with GDM as opposed to 14.9 percent in women without GDM. The less expensive delivery option, or natural vaginal delivery, was much less common in women with GDM (78.9 percent compared to 85.1 percent in women without GDM).

Considerable differences exist in healthcare costs among women with and without GDM in the literature. The cost of insulin prescriptions added to the total bill, as 29.1 percent of women with GDM had to inject insulin. The average cost of visits to

secondary providers was 2.3 times higher in women with GDM (Kolu et al., 2012). This is because they had more frequent visits in order to ensure that blood glucose levels were maintained. Inpatient hospital stays both before and after delivery were 44 percent longer for women with GDM. These deliveries typically involved higher rates of induction (27.1 percent in women with GDM versus 13.9 percent in women without GDM). Induction refers to the method of initiating labor via pharmacological (oxytocin) or physical methods (amniotomy) (Agency for Healthcare Research and Quality, 2009). The cost of delivery seemed to be significantly impacted by the GDM complication. Stays in the NICU immediately after birth for the newborn led to 49 percent higher costs than a baby born to a mother without GDM (Kolu et al., 2012). Chen and colleagues (2009) mentioned that prevention of GDM as well as GDM interventions [via educational programs performed by primary and secondary providers] have the potential to reduce the national economic burden and impact the economy positively.

Not only does gestational diabetes mellitus pose a significant financial burden on the United States, it also poses social costs for the health and well being of children born to mothers with GDM. Research indicates that children born to mothers with GDM are at a greater risk for obesity. Chandler-Laney and colleagues (2012) assessed children aged 5-10 years with and without intrauterine exposure to GDM. Children with intrauterine exposure to GDM had greater total percent fat and greater central adiposity. They also had greater insulin secretion and lower HDL cholesterol regardless of their current weight status. Researchers reported that high blood pressure and dyslipidemia are more common in children having had intrauterine exposure to GDM. Intrauterine exposure to GDM can lead to impaired metabolic health (Chandler-Laney et al., 2012).

Dabelea (2007) examined studies pertaining to the effect of intrauterine exposure to GDM on offspring. She found children exposed to diabetes in-utero had excess fetal growth accompanied by the production of additional insulin to compensate for an increased glucose load. This promotes growth and adiposity. Children exposed to diabetes in-utero were also at greater risk for obesity and type 2 diabetes (Dabelea, 2007). Researchers at the Diabetes in Pregnancy Center at Northwestern University examined offspring of a multiethnic population of women who had GDM. Children exposed to diabetes in-utero were 30 percent heavier than was expected for their height. Researchers also found that offspring of mothers with GDM had higher prevalence of impaired glucose tolerance than offspring born to mothers without GDM (19.3 versus 2.5 percent).

Offspring of mothers with GDM have also been shown to experience cardiovascular abnormalities. Elevated systolic and mean arterial blood pressure and higher concentrations of cholesterol to HDL were discovered in these individuals (Dabelea, 2007; Chandler-Laney et al., 2012). Marco and colleagues (2012) suggest that these offspring may be at cardiovascular risk due to metabolic changes, epigenetic changes, or due to a direct effect on their vasculature. The increased risk of central adiposity and obesity alone predispose these children to the development of cardiovascular problems.

The social costs and impact of GDM on the developing fetus are important aspects to consider. If GDM can be managed appropriately via GDM educational programs, then adverse complications for both the mother and the developing fetus can be greatly reduced. These adverse complications: obesity, type 2 diabetes, cardiovascular disease etc. account for a significant amount of the nation's healthcare burden.

Minimizing these adverse complications via appropriate GDM management and educational programs can reduce the economic burden to our society.

Providers' Experience in Caring for Women with GDM

The providers' perspective is often overlooked when examining low-fidelity or attendance to educational programs and how women can be motivated to adhere to their treatment protocol. There are two main types of healthcare providers: the primary and the secondary provider. The primary provider is the family physician or obstetrician in the case of GDM. The secondary provider is one who offers counseling and support in addition to the treatment plan prescribed by the primary provider (i.e. nurses, registered dietitians, diabetes nurse specialists). Midwives are secondary providers that nurse women through a normal pregnancy, normal birth, and postpartum care. The obstetrician is responsible for medical complications related to pregnancy and therefore steps in as the primary provider when complications develop. Collaboration between the midwives and obstetricians is crucial for optimum pregnancy outcomes (Persson, Hornsten, Winkvist, and Mogren, 2011). Understanding the provider's perspective can provide health professionals with insight and allow for a better understanding of low-fidelity among this group.

Persson et al (2011) examined how midwives perceive their role in counseling women with GDM. Findings from this study offer effective strategies for dealing with women with GDM and provide direction for future research. Researchers interviewed 12 midwives over ten sessions and used grounded theory for analysis. Providers discussed initial treatment and protocol for extended care. Treatment at diagnosis consisted of diet, physical activity, and blood glucose control. Counseling was continued on a regular

basis as long as the women's blood glucose (BG) fell within the recommended range. Topics for the interviews consisted of both successful and unsuccessful counseling, sources that provided the support and knowledge necessary for treatment, and the perception of the condition.

There is such little time for lifestyle changes between diagnosis and delivery that all measures must be taken in order to ensure proper treatment methods are being followed. Secondary providers found tactics that worked when counseling women with GDM, as well as tactics to avoid. It was suggested that confrontational topics should be avoided as they negate the empowering relationship. They suggested that the provider's role to monitor the women and to evaluate and question low-fidelity. The best approach to educational sessions is to be supportive and encouraging. Assertiveness, or the act of "pushing" the women, weakens the relationship as well as fidelity rates. Researchers suggest generating a support group for secondary providers that coaches them through counseling techniques for women with GDM. Recommendations for future studies included investigating what interventions/strategies work in a clinical setting (Persson et al., 2011).

Support for Medical Nutrition Therapy and Counseling

The next couple of studies solidify why GDM educational programs, along with medical nutrition therapy (MNT), are crucial to controlling GDM. Stasenko, Liddell, Cheung, Sparks, Killion, and Caughey (2011) studied the efficacy of educational interventions with regards to follow-up rates for women with GDM postpartum. They evaluated the impact of written and verbal counseling on postpartum glucose screening and whether or not counseling increased the follow-up rates. A retrospective cohort

study consisting of two groups was conducted. One group received counseling while the control group did not. Topics included in the counseling were the importance of postpartum follow-up and the increased risk for type 2 diabetes. Handouts were given on how to obtain an oral glucose tolerance test (OGTT) and blood sugar follow-up in the future, and recommendations were made for weight loss and exercise. Medical records were checked six months postpartum to observe whether or not the women came back for glucose testing (Stasenko et al., 2011).

Results from this study showed that counseling had a significant impact on the follow-up rates. In fact, 52.7 percent of women in the counseling group returned for glucose testing as compared to 33.4 percent in the control group. Follow-up rates were highest among: Hispanics, women under 35 years old, women 37 weeks or more into pregnancy, and among women having preterm deliveries (Stasenko et al., 2011).

Health status and the impact of MNT is also an important topic to be considered. Anwar et al (2011) used a retrospective cohort study with experimental and control groups to assess the impact of pre-pregnancy counseling (PPC) on the health of women with GDM. Counseling sessions were provided by a multidisciplinary medical team consisting of obstetricians, physicians, diabetes specialist nurses and registered dietitians. Clinics were held on a weekly basis and follow-up appointments were provided as needed. Components covered in counseling included: consideration of medical conditions, drug treatment, smoking and alcohol use, advice on glycemic control, organized screening for diabetic complications, and congenital malformation. Improved hemoglobin A1C levels and weight gain were observed in women who received counseling (Anwar et al., 2011). The rate of congenital malformations was reduced in

babies born to mothers who received counseling (2.1 percent in mothers receiving PPC as opposed to 6.5 percent in the control group). The authors attributed these positive results to the fact that mothers who attended counseling were made aware of their disease and were motivated to control it and were from higher social and educational status. In addition, they found that significantly more women in the control group took folic acid supplements and significantly fewer consumed alcohol.

Areas to note on the approach to diabetes management prior to conception included: the impacts of social/lifestyle issues, non-adherence to medical advice, language difficulties, difficult domestic circumstances, and erratic and busy lifestyles (Anwar et al., 2011).

Conclusion

Several common themes emerged throughout the literature review. Women with GDM experienced feelings of anxiety, mainly because they were concerned about how GDM would affect the health of their infant as well as their own health. Women with GDM expressed interest in obtaining more information about their condition but were hesitant to implement lifestyle changes because they did not feel supported by their healthcare providers, were afraid of needles, and believed that making dietary changes was too challenging. Studies revealed that women wanted more personalized treatment plans for the management of their condition from providers who were genuine and did not use scare tactics. Another significant point revealed in these studies is that screening and diagnosis occur so late in pregnancy that there is hardly any time to make lifestyle changes to improve the health of mother and baby before delivery. This may suggest that screening should occur earlier in the pregnancy for women who are at high risk for GDM.

Barriers to treatment included the stress of implementing healthy eating with the family, time and money constraints, concern for the needs of the baby, and the return to work (it caused more time constraints with regards to packing and having the time to eat healthier meals during the day). Facilitators included handouts and support from healthcare professionals and family. Healthcare costs are 2.3 times higher for women with GDM (Kolu et al., 2012), thus increasing the need to explore ways to make educational programs more efficient and to increase fidelity in women with GDM. When women were provided with MNT postpartum, they became aware of the risk for developing type 2 diabetes in the future. They were also given the proper knowledge and materials necessary to reduce the risk of developing any complications in the future as a result of GDM.

Chapter Three - Methodology

The purpose of this research was to explore the experiences of women with GDM and to describe factors (i.e. reasons for attending, barriers, motivators, class format and support) influencing GDM educational program attendance.

Research Design

A qualitative method was used in the study. Information was obtained through semi-structured telephone interviews. The semi-structured telephone interview created “interviewer invisibility” (Oppenheim, 1992) and was chosen because it was low cost and the researcher had the ability to explain questions to participants, therefore increasing credibility due to validation of responses by participants themselves (Gray 2009; Kumar 2011). Several researchers studying the experiences of women with GDM and the barriers and facilitators to care have used semi-structured interviews (Nolan et al., 2010; Carolan et al., 2012).

Participants

The target population for this study was women with GDM. Participants were selected from a list of women who attended gestational diabetes educational programs at the Baptist Health outpatient facility in Lexington, Kentucky. Inclusion criteria included women between the ages of 18 and 45 who currently have GDM or had GDM in a previous pregnancy within the last one-two years. Women who were under the age of 18 or over the age of 45, had type 2 diabetes, or did not have a GDM diagnosis were excluded from participating.

Recruitment began with an initial phone call to each prospective participant. The researcher read the pre-approved script in order to obtain consent. When the woman

agreed to participate, the interviewer proceeded with the semi-structured phone interview. If there was no answer upon the initial call, then the researcher left a message and attempted to call at a later time in order to obtain consent.

Semi-Structured Questionnaire

Questions for this study were adapted from a study conducted by Carolan et al (2012). Questions were open-ended, and had no right or wrong answer allowing participants to provide answers that reflected their perceptions and experiences. These types of questions have been shown to be suitable for qualitative research. Diabetes educators and researchers reviewed the study questions for content validity. Questions were pilot-tested with four women who had GDM and were not part of the present study.

Questions included:

1. How many of your pregnancies have been affected by gestational diabetes?
2. Were you referred by your physician to take GDM educational classes and to attend follow-up visits with registered dietitians, certified diabetes educators or diabetes nurse specialists?
3. Can you tell me about your experience of gestational diabetes?
4. Can you share with me some of your reasons for attending the gestational diabetes classes?
5. What made it easy for you to attend the educational classes at Baptist Health?
6. What made it difficult for you to attend the educational classes?
7. Can you tell me about the information you received from these classes?
8. What other information would you have liked?

9. There are many different ways to hold diabetes educational classes, for example, face-to-face appointments, online classes, texting of information and so on.

Which type of class would you prefer? Why?

10. What type of support would you like your diabetes educator to provide?

Data Collection and Analysis

All telephone interviews were recorded and transcribed for analysis. Each interview took approximately 20-30 minutes. The transcribed sessions were analyzed through line-by line, or axial coding, where a label or code was affixed to chunks of text (Strauss & Corbin, 1990). Two individuals independently read the transcript and highlighted words, sentences/phrases and concepts (Airhihenbuwa et al., 1996). An inter-coder reliability of .90 was used to establish reliability (Gray, 2009; Kumar, 2011). Approval for the study was received from both the University of Kentucky and Baptist Health Institutional Review Board.

Limitations

Limitations of this study included a small sample size and a convenience sample. Participants were only recruited from Baptist Health Hospital in central Kentucky. This bias prevents the results from being generalized to other populations. However, the results will be useful for primary and secondary providers who are looking to improve their GDM educational programs and increase patient fidelity. The participants may have experienced recall bias, or an inability to remember the GDM experience clearly, if they had gone through the program one-two years prior. Participants may have also responded with what they thought the researcher wanted to hear. This is called a social desirability bias, and may have affected the accuracy of the results.

Chapter Four – Results

Demographic Characteristics

A total of 21 women participated in the study. All women had been diagnosed with gestational diabetes and had been referred by their physician to attend the “Life with Diabetes” gestational program at Baptist Health between September 30th, 2012 and September 30th, 2013. Just over two-thirds (67%) of the participants were between 26 and 35 years of age. Fourteen percent (14%) were between 18 to 25 years of age and another 14% were between 36 to 40 years of age. The majority of participants were Caucasian (81%) followed by African American (14%) and other races (5%). Most participants were professional (62%). Most of the women (86%) were married and approximately 15% were single. The mean body mass index for all participants was 34.36 ($SD = 6.34$) kg/m^2 . The mean number of pregnancies experienced with GDM was 1.19 ($SD = 0.11$). See Table 4.1 below on participant demographics.

Table 4.1: Participant Demographics

Characteristic	Levels	# Participants	% Participants
Age	18-25	3	14.3
	26-30	7	33.3
	31-35	7	33.3
	36-40	3	14.3
Ethnicity	African American	3	14.3
	Caucasian	17	80.9
	Other	1	4.8
Occupation	Manual	2	9.5
	Professional	13	61.9
	Retired	1	4.8
	Unemployed	4	19
	Unknown	1	4.8
Marital Status	Married	18	85.7
	Single	3	14.3

Question 1: Can you tell me about your experience of gestational diabetes?

Meal Management Changes

About one-third (7 of 21) of the women described their experience as being focused on making meal management changes. Many of these changes proved to be challenging for these women. One participant describes managing her diet with GDM, “Diet changes were the most difficult. I felt that I already didn’t eat right. I mostly ate sweets and soda. It was hard to give that up and to eat right.” Another participant mentioned, “I mean I had to change my diet.” One participant even reported, “Well it was completely life changing because things that I was used to doing and eating before I could no longer do. I was not used to eating so many times a day – breakfast, lunch, dinner, snacks, I wasn’t used to eating that much. And trying to stay away from the carbs was difficult.”

Blood Glucose Monitoring

Women also characterized the focus on blood glucose monitoring as part of their GDM experience (4 of 21). One woman described the difficulties of monitoring by saying, “The finger sticks were probably the hardest part to keep up with.” Another participant explained the impact of blood glucose monitoring on both her schedule and diet, “I mean I had to change my diet and take insulin. I prick my finger four times a day. I take insulin twice a day.”

Control of GDM with Diet

Some participants also mentioned that their experience was one in which they were able to control their GDM with diet (4 of 21). For example, one woman indicated, “I just had to eat different and manage it, but mine was controlled.” Another explained,

“I found out at 24 weeks that I had gestational diabetes. I took the class over at Central Baptist and I was able to control it [GDM] with just diet.” Another participant described how she was able to use diet to keep her blood glucose under control, “I had been on bed rest for seven weeks so my doctor thinks that because of the inactivity that I was going through that it increased my blood sugars. So I was able to control my gestational diabetes with – I couldn’t exercise but I was able to do it completely through diet. And the entire time, so from 32 weeks – and I had my little girl at 38 weeks – I didn’t have any high blood sugar results so I was totally able to control it with my diet.”

Even though not as common as the previous themes, three women mentioned that they accepted the GDM diagnosis. They stated that they got used to the diet changes and the blood glucose monitoring. Only two participants mentioned that their experience was one of concern for the baby because they did not want their baby to have any complications as a result of their GDM.

Question 2: Can you share with me some of your reasons for attending the gestational diabetes classes?

The reasons for attending varied among participants, but, the three most common reasons that women gave for attending the gestational diabetes education class were: because they wanted to get additional information or education regarding GDM (13 of 21), because the doctor or another healthcare provider had referred them and recommended they attend the class (10 of 21), and out of concern for their baby (6 of 21). Some women provided responses in two areas.

More Education/Information on GDM

For many of the women this was their first encounter with gestational diabetes. They were not aware of dietary and lifestyle modifications associated with management of the condition. Therefore, they chose to attend the class in order to become educated and to receive additional information to help them cope with their condition. Some of the specific reasons for attendance were, “To get ideas on how to manage it [GDM] and how to cope with not only the actual diabetes part but with keeping my blood sugar down.” Other women mentioned they attended the GDM class “For education,” and “I just wanted to make sure that I had all of the information to do what I needed to do.” Some had family members who had diabetes and were interested to learn more. For example, it was shared, “A lot of my family members have diabetes so I wanted to be more educated about it.” Specific information regarding diet and blood glucose were also expressed as reasons for attending, “I wanted to learn how they wanted me to control it [blood glucose] with diet” and “I wanted to make sure that I knew how to eat.”

Doctor’s Recommendation

Many of the women simply attended the class because their doctor or another healthcare provider recommended it and they wanted to follow-through with their doctor’s orders. Several women specifically stated this reason, “I just went to the doctor and she recommended it or the doctor recommended it for my baby so I did it.” One woman mentioned that she felt confident with the information on GDM but wanted to attend anyway because the doctor told her she should, “My doctor recommended it anyway even though I already knew the diet and everything.”

Concern for Baby

Women chose to attend the GDM class because they were concerned for their baby. One woman said her reason for attending was “For the safety of my kid.” Other reasons for attending were cited as “For the well-being of my child” and “To make sure that the baby was okay.” Some women recognized the impact their pregnancy could have on the health of the child, “I went so that I would be able to take care of it [GDM] while I was pregnant so that the baby would be okay” and “Just the fact that it could possibly have some impact on my child forced me to get that additional help.”

Question 3: What made it easy for you to attend the educational class at Baptist Health?

One of the objectives of the present study was to identify what motivates women to attend GDM educational programs. Several themes came up during the phone interviews regarding what made it easy for women to attend the GDM class. The most common theme expressed by 9 of 21 women was that of flexibility (scheduling class time, work schedule). The second theme was location of the GDM class (5 of 21). Thirdly, 4 of 21 women reported the support of a family member made it easy for them to attend. Even though not as common, some participants mentioned that the friendliness and helpfulness of Baptist Health Diabetes Center employees as well as concern for the baby’s health were factors that made it easy for them to attend the GDM classes.

Flexibility

Many women indicated that the flexibility in scheduling the program and the times the program was offered made it easy for them to attend. “They did offer me a couple of different times, which was nice;” two women explained, “The time was good

for me,” and “The times that it was offered were really convenient.” One woman mentioned that the “Flexibility of her schedule” helped her to be able to make the class at one of the times it was offered. Another stated, “My work is really flexible so it was easy to get off so that I could attend.”

The helpfulness of the staff in scheduling times to attend the class was mentioned as a factor that made it easier to attend the GDM class. Some participants stated, “They worked with me as far as what time I could come.” Another participant adds to this by stating that a motivator to attendance was that she did not have to wait long for the next available class. “They said they have a class that I could go to and they actually called me about it and said that it was next week. I didn’t have to wait very long for it.”

The fact that the class was offered in one short session made it possible for women to attend. “It wasn’t extremely long. The fact that it was just a one-time thing, I think I was there, I don’t know, and hour and a half to two hours the most...that was helpful because I think if I’d had to go back a second time it would have been harder.”

Location

The Baptist Health Diabetes Education Center is located in central Lexington near a main road and connecting bypasses. This geographic location was reported as a contributing factor when many women were deciding whether or not to attend the GDM education program. Several participants describe the accessibility of the center, “They were close to my house. They were not downtown, “ “It was actually right across the street from my work,” “I think the location was good for me,” and, “It’s in a convenient location.”

Support of Family Member

Several family members of the participants were able to attend the educational session along with the women. This support network facilitated attendance. One participant explained how her husband's presence helped her to focus, "I brought my husband along with me. He would also make sure that I stayed on-task and knew how important it was that I did my finger sticks and that I watched what I ate." Another explained the added benefit of her mother being able to come to the class with her, "My mom was welcome to come with me, that was nice, and she's diabetic. And so because I had gestational diabetes and seeing her as a diabetic it was good for me and her to be able to come to the class at the same time." In this case, not only did the expectant mother benefit, but so too did her mother with diabetes. Two women also mentioned that the support they had at home and the support of their husband made it easy to attend the GDM class, "I guess the support I have at home," and "The support of my husband."

Friendliness/Helpfulness of Employees

Some women mentioned that the staff made it easy to attend the class. Demeanor, friendliness, care and compassion that were shown to them by hospital employees made it easy for participants to attend the gestational diabetes class. One woman explained, "The employees were very friendly and they made you feel welcome." Again it was stated, "The people were super friendly and helpful, including getting me set up. I called before and they got me set up with my insurance and all that good stuff," and "They just set everything up and you just showed up at the doctor's offices."

Concern for Baby's Health

A few of the women mentioned that they attended the GDM class out of concern for their baby. They stated, "For the sake of my baby," "It was all about making sure she [the baby] was okay." and, "To provide the best health that I could for my child. His health was more important than anything."

Question 4: What made it difficult for you to attend the educational classes?

Approximately three-quarters of the women (15 of the 21) mentioned that they did not have any difficulties attending the class.

Of the six who expressed a difficulty in attending the GDM educational class, most had to do with the time the class was offered (4 of 6). One woman commented, "I wouldn't say that it was easy because just the timing itself – I work very long hours so the requirements to take all 3-4 hours during the day was not necessarily conducive, particularly with maternity leave upcoming... if there were some evening classes I would be very happy. It'd just be nice if the working mothers were considered as well. For particularly working mothers who are already taking off a great deal for doctors' appointments it is difficult to have to take off the remainder of the afternoon for the class." Another simply stated, "It would've been nice to have had one offered later on in the afternoon and from what I remember it was only a couple days a week that it was offered." For some of the working mothers, their work schedules conflicted with the GDM class times. One woman offered a suggestion for dealing with this barrier, "I had to take time off work to get over there. They had said that it was either a 9 o'clock or a 10 o'clock slot so either way I would've had to take time off. So there's really nothing that would have alleviated that unless there was an evening or weekend slot."

Question 5: Can you tell me about the information you received from these classes?

The class for women with GDM consists of two parts: one part with a registered dietitian, the other with a registered nurse. When asked about the information covered during the class, participants reported that the information was given in two segments. One segment consisted of the instruction by both the dietitian and the nurse. The other segment covered information in a course booklet that women could take home for reference. Three main themes emerged related to information received during the class: information about meal planning, blood glucose monitoring, and information about GDM. The results of each of these themes will be discussed in the sections below.

Information about Meal Planning

Almost all participants (20 of 21) reported that meal planning was covered. The three most common meal planning topics were carbohydrate counting (11 of 21), portion control (7 of 21), and foods to include and exclude throughout the day (7 of 21).

Both the exchange system and carbohydrate counting were described during the interview when participants explained how the instructors taught them to monitor their carbohydrate intake. One woman explained, “The most helpful information was the diet piece and how to count your carbs and things like that.” Another elaborated, “They gave me a breakdown based on my information of what I should be eating for breakfast, lunch, dinner and snacks. Like how many carbs I should be eating or like how many sugars I should be eating for each of those.” Another participant mentioned, “They gave us little journals, they gave us a book on how many carbohydrates you should have throughout the day and what, like an apple is one carb. They gave examples of a meal plan.”

Portion control surfaced as another significant component to the meal planning tactics taught during the class. Put simply, one woman stated, “It was about portion control.” Another described visuals and tools used during class to better explain portion sizes, “They had actual fake food to show portion sizes.” One participant mentioned, “Other things were covered as far as portion control. It wasn’t just carbohydrates, it was also portion control and snacking.”

The third most common topic covered pertaining to meal planning was foods to include and foods to exclude during the course of the day. With GDM there are many foods that must be eaten in moderation or eliminated altogether due to their effect on the body’s blood glucose levels. Women recalled that the dietitian explained to them which foods minimized blood glucose spikes and which foods had the potential to raise blood glucose. “They gave me a nutrition guide with all of the food that was good that I could eat and everything that I should avoid. They printed me out a sample diet plan so that I would have something to go by, like how much I could be eating and what I could eat and everything.” Another said, “A dietitian went over what kinds of food I should be eating and when and what quantities.” Simply stated, “I met with a dietitian and she went over all of the foods based on what I could eat, the calories and stuff so that I would be able to control it.”

Blood Glucose Monitoring

According to participants, a registered nurse taught the blood glucose-monitoring portion of the class. This half of the class was broken into two parts: a demonstration on how to use the glucometers that were provided during the class and a discussion of appropriate monitoring techniques, normal blood glucose levels, and how to log the

numbers. One woman stated, “They showed me how to use a meter.” Another explained, “We learned how to use our monitors and we talked about what was a comfortable reading after fasting and after meals. We were given planners in terms of monitoring our levels.” In terms of the monitoring process and how to record blood glucose values some stated, “The nurse showed us how to test and record what our numbers actually should be. They gave us worksheets that we could track our daily diet and they gave us all of the booklets for the glucose meters.” Another woman mentioned that the nurse explained what to do if abnormal readings were taken, “They gave me a little booklet for once I got home...what to do if you had a low reading...so what to do in that case step by step.”

Information about GDM

Women received a broad range of information on GDM both during the class and in the take-home booklet. The most common topic covered was the effect of GDM on both the mother and baby (4 out of 21). One individual expressed, “I learned about how diabetes affected the baby and me.” Another described the information she received, “They gave me a little book with all of the information about gestational diabetes and what it can cause and how it affects you and how it affects the baby.” This same woman went on to explain how the effect of GDM on delivery was discussed during her class session, “We talked about how she could end up being a big baby and the effects that it would have on her and me of course trying to deliver.” A few women also indicated that GDM and diabetes in general were described to them by one of the course instructors. One woman said, “They gave me a lot of information about what gestational diabetes was, what causes it, how to change eating habits to try to get it under control.”

Question 6: What other information would you have liked?

A majority of participants (18 of 21) were satisfied with the material provided during the class. They felt that their expectations had been met and that all pertinent information was covered in a logical manner. One woman exclaimed, “They covered everything.” The majority of participants claimed there was no additional information they would have like to receive. Those who wanted more information stated they would have liked more information on what to expect after the baby was born in terms of blood glucose levels and diet and blood glucose monitoring in general. One participant talked about her need for follow-up postpartum, she wanted more information in this area and stated, “What to expect afterward because they just kind of said as soon as you have your baby you’ll go back to normal. I guess to know what to expect when the baby is born or what this means. Should I stick with this diet? Do I need to eat a certain way again? I guess that would’ve been helpful because I got the impression that when my baby was delivered that’s it, you’re back to normal.”

Another woman was confused about monitoring her blood glucose and expressed her need for additional information on the monitoring process, “I wasn’t completely sure on when I tested...like I prick my finger and say I ate and I was supposed to wait the 2 hours and then I prick my finger. At first I wasn’t sure if I was supposed to, like if I got hungry during that 2 hours, if I was allowed to eat or not and I didn’t think to ask while I was there actually. Maybe that could have been a little more clear.”

Question 7: There are many different ways to hold diabetes educational classes, for example, face-to-face appointments, online classes, texting of information and so on. Which type of class would you prefer? Why?

Face-to-Face

When asked about their preferred method for diabetes educational classes the majority (16 out of 21) stated that they preferred face-to-face classes. One woman stated she preferred this format for the following reasons, “I prefer face-to-face because it is more interactive, like how to get education regarding the diabetic diet and everything. Plus with face-to-face we can interact more like if we have any questions like that.” Another elaborated on the benefits of interacting with others throughout the class, “Face-to-face with other people because you can hear other people’s stories and when you have someone there who is actually explaining everything to you and hands-on demonstrations it’s better. Face-to-face is a whole lot better when you’re dealing with something like that with your health or your child’s health.” One participant described how the class was designed to fit the needs of her learning style; “I like the face-to-face because I think I just learn best by doing. Like I said it helps me to talk face-to-face to people and to actually do the meter reading and to look at the book right in front of me with someone that knows what they’re talking about sitting next to me.”

Online

There were 8 of 21 participants that stated a preference for online GDM classes. One woman explained the convenience of accessing the course online, “Probably an online class because it’s more convenient when you’re working.” Another expressed the ease of fitting an online class into her schedule, “Online just because it’s easier to adjust

around your schedule.” This idea of an online class being conducive to a busy schedule is described in detail by one participant, “I would have preferred probably an online session because I am a self-directed learner so a webcast or a podcast would’ve done the same thing for me. And I could have done it on my own time without having to take off an entire afternoon to do it.” Even though a course booklet was provided, some women would have preferred an online version of the class that they could reference at home. “Internet would work best because if you have the information online then you can refer back to it.”

Texting/Emailing of Information

There were 4 of 21 participants that preferred texting or emailing of information. One woman indicated that texting could be a beneficial way for instructors to be supportive coaches throughout the duration of the pregnancy, “Maybe if somebody needed or wanted more supportive coaching throughout the duration I think that the texting would be helpful as well.” She explained that they could have texted, ‘Hey how are you doing? Do you have any questions? Here’s the website and some recipes,’ those kinds of things.” Another participant thought that it would have been good if she had an opportunity to text the instructors, she stated, “But it would be nice to be able to send a quick text message and say, ‘oh I’m kind of confused about this’ and they’d answer you back in a text. If I could do text messages I would be ecstatic.”

Additional formats suggested by participants included a teleconference or a video chat. One participant explained, “A teleconference or something - you could still ask questions.” Another mentioned, “I am a self-directed learner so a webcast or a podcast would’ve done the same thing for me.”

Question 8: What type of support would you like your diabetes educator to provide?

Over half of study participants (13 of 21) reported that they felt like they did not need any additional support after the class because the class met their expectations. One woman stated, “Honestly, the class was excellent from my experience. They gave me all of the information; they even gave me the meter to take home so you’ll be able to check your glucose. I really enjoyed the meeting and it was very educational.” Another shared similar feelings, “I think they’ve done well enough. They did give me all of their information so you know you can call us back any time for anything. And you can even go back if you want to for questions. You can make an appointment and see them anytime so I think they’ve done really good.” A third participant said, “I expected them to be compassionate about it, to give me guidance on how to maintain a diabetic lifestyle; I mean they just met every expectation that I had.”

However, 8 of 21 participants suggested other types of support that they would like their diabetes educator to provide. Even though blood glucose monitoring was covered during the GDM classes, a couple of these women expressed that they would have liked more information on how to monitor and control blood glucose. “I guess ways on how to monitor and control it. I guess I was nervous because I had heard that some people had to take insulin and I really didn’t want to do that. So I was really curious to see other ways of controlling it. And then definitely the way to actually monitor your glucose because I didn’t know how...I actually didn’t realize that you had to do it four times a day.”

Four of the twenty-one participants indicated that they would prefer additional support information related to diet and meal planning. One shared, “Maybe some information on snacks and meal prep ideas.” Another mentioned the need for more culturally appropriate information, she said, “Like I’m an Asian so based on Asian food how we should ...maybe dietitian can tell us what sort of Asian food can be able to eat or anything through the diet period to control my diabetes. What if anyone can be able to explain about Asian food? Like American, Mexican, Asian, Indian type of ...if the person is different, I mean everyone has different cooking habits right?” Other forms of support recommended by study participants include; increased accountability, a follow-up with a phone call, more than one follow-up after the class and an individual or small group setting for each class session. For example, one woman explained, “Accountability definitely would have been...it would have been great.” Two women express their feelings regarding follow-ups, “Maybe a phone call, but again they were very nice and caring, they put all of these numbers down in my booklet for if I had any questions or thought of anything. So I knew that I could get in-touch with them if I had to. It didn’t matter.” And, “I guess just if they followed-up more than just once afterwards. When I went back to my doctor like a month later he checked my numbers and said I didn’t have to do it anymore. They were all fine. So I guess if they followed-up more than just once then maybe I could have quit checking earlier.”

Chapter Five – Discussion

The purpose of this qualitative study was to explore the experiences of women with GDM and to describe factors (i.e. reasons for attending, barriers, motivators, class format, and support) influencing GDM educational program attendance. The objectives were; (1) to understand the experiences of women with GDM, (2) to identify barriers associated with low-fidelity to GDM educational programs, (3) to identify facilitators to attendance, and (4) how the program can be improved to promote fidelity in the future. Eight semi-structured questions were asked of participants during the interviews in order to meet the research objectives. The results of each question will be discussed independently of one another in the following section.

Question 1: Can you tell me about your experience of gestational diabetes?

Three common themes emerged that characterized the women's experience in dealing with GDM: meal management changes, blood glucose monitoring and the ability to control GDM with diet. Hirst et al (2012) found that upon GDM diagnosis, women were worried about making appropriate dietary changes as well as blood glucose monitoring. Nolan et al (2010) found that women experienced difficulty in adhering to dietary advice as well as blood glucose monitoring at home. Many of the participants in the present study mentioned that after the initial diagnosis, diet changes were the most difficult. They felt that it was hard to control their diet and to give up the foods they were used to eating in an effort to manage their diabetes. Their experience consisted of challenges related to meal planning, finding which foods affected their blood glucose most, timing of meals, eating frequency, and closely monitoring intake.

Continuous self-monitoring of blood glucose was seen as a significant part of their GDM experience in the present study. Some of these women became very concerned if their numbers were either too high or too low. For many of the participants it was a constant trial and error to see which foods affected blood glucose levels most. The initial part about learning how to use the meter posed a challenge for some women. In this study women expressed difficulty in learning how to use the meter. Such difficulty was not mentioned in the literature. Women mentioned that they were hesitant to test because they were afraid of needles and feared that the insulin might harm their unborn child (Nolan et al., 2010; Hirst et al., 2012).

While meal management was ongoing for most participants in the present study some women reported that they were able to control their blood glucose with diet. This information was not found in other studies. Many of the participants in the present study were confident that with the information obtained from the GDM educational program, they could manage their condition. These findings are not consistent with previous studies. When asked about their experience with GDM, women in other studies seldom report that they were able to manage their condition. This may be because previous studies were not looking at the experience of GDM combined with a GDM program, like the present study. Previous studies reveal that meal management and dietary changes were a large component to the GDM experience but there was no evidence that participants were able to control their condition through diet.

While the challenges associated with meal management and blood glucose monitoring may differ among study populations, it is evident that women with GDM include dietary changes and blood glucose testing within their overall experience. The

American Association of Diabetes Educators (2014) includes blood glucose monitoring and healthy eating as two of the seven self-care behaviors. It is important for diabetes educators to focus on the areas that comprise women's experiences with GDM: meal management changes and blood glucose monitoring. If these areas are addressed thoroughly, then it is likely that women will have the knowledge and skills necessary to make the appropriate lifestyle changes to manage their GDM.

Question 2: Can you share with me some of your reasons for attending the gestational diabetes classes?

Participants reported that they chose to attend the GDM educational program at Baptist Health for three main reasons: for more information about GDM, in order to follow the doctor's recommendation, and out of concern for their baby. Carolan et al (2012) revealed that women felt they lacked the education and skills necessary to manage their GDM. Women were more likely to attend educational programs when they realized they were responsible for their own care and for the baby's health. Many of the participants had no prior knowledge of GDM at diagnosis. This lack of knowledge regarding GDM, what causes it, the consequences, and how to manage it during pregnancy were reasons women attended the class. Women wanted to familiarize themselves with ways to manage their blood glucose with diet. They wanted general information, meal planning tips, and instructions on how to test and manage their blood glucose. Essentially, women felt that the class would make up for their knowledge deficit and would provide them with the information and skills necessary to manage their condition. Dasgupta et al (2013) found that women participated in a GDM education program due to a desire to improve their knowledge of dietary intake. These results are

similar to what was found in the present study. Additionally, Dasgupta et al (2013) found that women attended these programs in order to benefit from a support system for behavior change. Researchers also found that women wanted to share their experience with both peers and health professionals alike and thus categorized that as reason to attend the program. Some researchers mentioned that women were more inclined to attend these programs if they were educated on their importance (Stasenکو et al., 2011).

A significant amount of importance is placed on the recommendations a physician makes to women with GDM. Many women in the present study admitted that they attended the GDM class because their doctor recommended it. Women not only wanted to follow their doctor's advice but they wanted to gain more knowledge in a program that was highly referred by their doctor.

In the area of concern for the baby, women expressed that they did not want their GDM to cause complications or harm their unborn baby. They wanted to manage their condition and do everything they could to prevent harming their child. This responsibility that the women felt to their unborn baby made them attend the educational class.

Question 3: What made it easy for you to attend the educational classes at Baptist Health?

Overwhelmingly, GDM class attendance was made possible due to the flexibility in class scheduling and the variety of times the class was offered. The staff at Baptist Health listened to participant's needs and made adjustments to class offerings as needed. They were warm and welcoming and treated participants as friends. The staff assumed the role of supportive healthcare provider. Women appreciated this because it made them

comfortable and trusting of the instructors. Women felt that the instructors and staff alike made a concerted effort to consider their needs when scheduling and planning the curriculum for the course. The staff was very quick to get new participants registered and scheduled for the next available class so that the women did not have to wait long. They appreciated the fact that there was not much time between diagnosis and the class so that they could start making changes as soon as possible. Not only was the staff accommodating, they were available to answer questions and deal with problems. This additional support made women feel more comfortable about attending the class.

Some of the women reported having flexible schedules themselves, which made it easier to attend the class at one of the times it was offered. Their work environments were flexible and employers understood the women's health needs. A handful of women were able to take time off from work to attend the class without consequence. This was not always the case for some of the women working full-time.

As far as time commitment, women explained that the class was a "one-time deal" that lasted for a couple of hours. The location of the center was convenient for many of the women. They did not feel as if they had to travel out of their way in order to attend. In other words, most women discounted transportation to the class as a barrier. Other studies have not looked at the impact of class length and location on educational program attendance.

Social support and encouragement played a significant role in motivating many participants to attend the class. Many women found that it was easy to attend because they had supportive spouses, significant others, or family members who either attended the session with them or offered their support at home.

Results from a study done by Dasgupta and colleagues (2013) are similar to the results of the present study regarding motivators to GDM educational program attendance. These researchers, too, found that support at home from family members was critical to one's willingness to attend the programs. The buy-in and support from the spouse/significant other at home was seen as an important factor in a woman's decision to attend educational classes (Carolan et al., 2012). Nicklas et al (2011) also found that having social support, either from a spouse or partner, motivated women to attend educational programs and to make healthy behavior changes. The desire to maximize the health of the unborn child motivated women to attend educational sessions and to adhere to GDM self-management methods in a study conducted by Carolan et al (2012).

Findings in the study by Dasgupta and colleagues (2013) differ from results of the present study. The potential positive effect of the class on eating habits among all family members, namely kids, was seen as a primary motivator or a reason that made it easy for women to attend educational classes. Another motivator suggested in the literature is the realization that women are responsible for their own health. This reality made women think about their future and the increased risk of type 2 diabetes. Women were motivated to attend educational programs and to do everything they could to minimize adverse effects once they understood that the outcome was solely in their hands (Carolan et al., 2012). Availability of childcare for women with older children at the time of the class was viewed as a motivator to program attendance (Bennett et al., 2011). One participant in this study mentioned that having childcare made it easy to attend the GDM class.

Question 4: What made it difficult for you to attend the educational classes?

Contrary to the findings in current literature, the majority of participants expressed no difficulty attending the GDM class. Current literature involving GDM educational program attendance does not report the same findings. There are many possible explanations for the difference. It could be because participants in this study were only required to attend once, the schedule was flexible, and staff was supportive in helping participants schedule the class.

For the participants who identified barriers to attending the class, the primary barrier was the times the class was offered. The time commitment required to attend the class conflicted with some of the women's work schedules. Women were worried about taking additional time off from work. They felt that it would be asking too much from their employer to get time off for the class, especially since they would soon be taking an extended period of time off during maternity leave. Carolan et al (2012) identified similar barriers. They found that the participants in their study found it difficult to find time for everything such as additional physician visits and appointments with a dietitian. They also found that often times the appointments could not be arranged at a time that was convenient for them, making attendance difficult. In the present study, some women indicated they would have preferred an evening or weekend class due to their work schedule. This is important to consider. Not all of the women referred to take the class are stay-at-home moms. It is important to offer convenient evening and weekend times for the class so that all of the women that need to can benefit. A majority of the women listed these selected barriers to attendance in their responses.

In contrast to the findings of the present study, Collier et al (2011) found that several barriers to GDM program attendance include limited access to care and limited time with the providers. Women felt that there was not adequate time spent with healthcare providers to address questions. Some women expressed difficulty in getting appointments to meet with specialists. The referral process was lengthy and often posed a barrier to appointment/program attendance. Women wanted providers to be easily accessible so that they could address any pertinent health issues in a timely manner. If this was not the case, women became discouraged to attend any diabetes-related educational sessions (Collier et al., 2011; Bennett et al., 2011). Even though other studies found that concern/lack of concern for the women's own health, lack in continuity of care and the reliance on numerous healthcare professionals for treatment were barriers to attendance, our study did not find these same barriers (Bennett et al., 2011). One possible explanation for this is that the women in the other studies may have been in larger hospitals.

Question 5: Can you tell me about the information you received from these classes?

It is necessary to understand topics covered in the GDM class as well as any materials that were distributed. The GDM class consisted of two parts: one with a nurse and the other with a dietitian. Meal planning, blood glucose monitoring and information about GDM were the main categories covered during the class, either via instruction or through the course booklet.

The information received from the GDM class at Baptist Health is similar to other GDM programs nationally. According to Evert and Vande Hei (2006), the Joslin

Diabetes Center in Seattle, Washington, offers a two-part GDM program. Both a dietitian and a nurse teach the 2-hour introductory class as well as the 1-hour follow-up class. During the introductory session, the nurse describes the effect of hyperglycemia on mother and baby, blood glucose self-monitoring, meter use, and the risk for diabetes later in life. The dietitian describes how macronutrients affect blood glucose, portion size, nutrients that are necessary for growth during pregnancy, and meal planning (Evert, Vande Hei, 2006).

Question 6: What other information would you have liked?

The overall perception of the class was that it was comprehensive and thorough. Participants indicated that material was presented in such a way that it was easy to understand. Most women found that the class provided all of the information they needed. Overall consensus was that the class, for the most part, provided the women with the information and skills necessary to manage their GDM. Women reported that the instructors were personable and spent adequate time addressing questions or concerns.

However, a few women indicated some areas that they would have liked the instructor to cover in greater detail. Many women were concerned with health implications and diet requirements after their baby was born. In other words, they wanted to know what to expect after the baby was born with regard to blood glucose levels and diet. These women were aware of the type 2 diabetes risks and wanted more information on acceptable blood glucose ranges and how to control them after delivery.

These findings are consistent with those of Nicklas and colleagues (2011) who found that the majority of study participants were aware of their risk for the development of type 2 diabetes. Collier et al (2011) also found that participants wanted more

information on the changes that could occur in blood sugar both during pregnancy and postpartum. Women in the present study wanted to know how often to schedule doctor's appointments or when to receive screening for type 2 diabetes postpartum. Participants in this study also indicated that they would have liked clarification on appropriate times to test blood glucose after eating. Additional diet-specific handouts were also requested to describe the diet plan in greater detail. One participant indicated that a break during the session would have been nice. These requests are important to consider when identifying ways in which the class can be modified in order to increase attendance. In addition to these suggestions, current literature has found that women with GDM would like sample menus and grocery shopping tutorials to help them better manage their diet and control their carbohydrate intake (Nicklas et al., 2011).

Question 7: There are many different ways to hold diabetes educational classes, for example, face-to-face appointments, online classes, texting of information and so on. Which type of class would you prefer? Why?

The current GDM educational class offered at the Baptist Health Outpatient Diabetes Education Center is face-to-face. The class may consist of an individual participant or a group consisting of two to three participants. The majority of participants indicated that they preferred face-to-face classes. They described benefits to the face-to-face format: immediate response to questions, personal support, interactive, ability to learn from other's experiences, accountability, receiving the glucometer and watching a demonstration on how to use it, and easiest way to learn how to use the monitor. Participants in a study conducted by Bennett and colleagues (2011) agreed that the interaction and connection built during face-to-face educational sessions or office visits

was important to them and facilitated their attendance. Focus group participants in the study by Dasgupta et al (2013) expressed that the social interactions and relationships built during face-to-face diabetes educational programs postpartum was beneficial and helped to create a sense of well-being. These benefits indicate that the face-to-face format of the current class is beneficial for most women.

Some women suggested the class be offered online due to the ease of access. They felt that if the class was offered online they could work through the material at their own pace and at a time that was convenient for them. In addition, the course materials would be available for future reference. Everyone is unique in that they have their own learning styles. An online course could benefit women who learn best by reading and absorbing the information themselves. An online course is available at any given time and does not require participants to be present for a certain number of hours. This format would allow many working women the chance to study the material without missing work or interfering with their schedules. These are important factors for diabetes educators to consider. Offering online courses would likely increase participation by working women.

Women in the present study mentioned that texting or emailing of information would also be desirable. They felt that texting allowed the instructor to act as a supportive coach throughout the pregnancy. They felt comfortable sending a quick text or email with questions or concerns to their instructor so that they could get an immediate response. The use of technology in health interventions is rapidly growing.

The findings of the present study can be compared to findings in existing literature. For example, focus group participants in a study by Nicklas et al (2011)

preferred internet-delivered diabetes education programs due to time constraints. Some women did suggest a combination of internet-delivered classes and group sessions. None of the participants indicated that a phone-delivered class would work for them. Women reported that social media and web-based groups were a useful tool to sharing and learning pertinent information about GDM management.

Question 8: What type of support would you like your diabetes educator to provide?

One of the four objectives of the present study was to identify ways of increasing GDM educational program attendance. One of the ways in which attendance may be increased is if the class is targeted to meet participant's expectations. Study participants had many common expectations as to the kind of support they would like their diabetes educators to provide.

Over half of study participants felt that the class met or exceeded their expectations and that they had no need for additional support. Participants did not need additional information because they felt all of their questions had been answered during the class. If questions were not answered during the class then they knew how to get in-touch with the instructors.

Clarification on monitoring blood glucose, meal planning, and dietary restrictions were expressed as areas that participants would have liked more information or support in. One participant mentioned the need for culturally appropriate information. This is a valid point and is something for diabetes educators to consider. It is important that educators understand individuals of various cultures and know how to tailor their recommendations based on each individual's cultural needs and background.

A small percentage of the women wanted more general information on their condition. They expected that the causes of GDM, as well as the consequences, would be explained to them in an understandable manner. They wanted to know what to expect throughout the pregnancy as far as the complications that may arise for them and the baby as well as what they could expect in general. Stasenko et al (2011) agrees that when patients are made aware of the need for glucose screening [and management], then follow-up attendance increases.

Other noteworthy types of support that surfaced during the interviews included increased accountability, a follow-up with a phone call, more than one follow-up after the class, and an individual or small group class setting. One woman felt that when her provider held her more accountable, she was more likely to adhere to the diet and lifestyle changes. Focus group participants in the study by Nicklas et al (2011), too, believed that increased accountability to a group or healthcare provider would help them to better manage their condition and to eat properly.

A few women in the present study wanted their diabetes educators to make themselves available for a phone call or follow-up in case any questions arose. Some women would have preferred a phone call from the instructor to check up. However, they knew that they had the instructors' contact information and felt comfortable contacting them. Family, peer and social support in general is proven to promote improved GDM management so that the risk of adverse effects may be reduced (Carolan et al., 2012). Overall, the class was beneficial and met or exceeded many of the women's expectations. They did however have some suggestions that must be considered when modifying the program for future participants.

Chapter Six – Conclusion

The purpose of the present study was to explore the experiences of women with GDM and to describe factors (i.e. reasons for attending, barriers, motivators, class format, and support) influencing GDM educational program attendance.

Women with GDM described their experiences as being focused on meal management changes and monitoring of blood glucose. These areas proved challenging for women in this study. Women were desirous of having additional information and support in meal management and blood glucose monitoring even though these areas were covered in the GDM class. Diabetes educators who plan these classes need to be aware that women with GDM are preoccupied with these areas and should continue to emphasize these topics. Women expressed the need for information both during pregnancy and postpartum. Diabetes educators need to find ways to provide follow-up information to women during postpartum. Women in this study identified this as a need. This strategy might prove effective in reducing the risk for type 2 diabetes in the future.

Many women also expressed concern for the health of their unborn child. Some described their experiences as one of concern for the baby; as a result they attended the GDM class, managed their blood glucose and made healthy food choices so that the child would be afforded the best of health. We learned in this study that having a doctor refer women to the GDM class could increase attendance. Many women attended the GDM class because they were told to do so by their doctor.

This study highlighted the need for flexibility in scheduling GDM classes so that women with GDM would get the information and care they need to manage their condition. Women in the workplace stated that they experienced difficulty attending the

GDM class. Diabetes educators need to consider scheduling classes after work and on weekend so working women can attend. The format in which these classes are offered also needs to be examined. Most women in this study mentioned that they preferred a face-to-face format because they could interact with instructors and other participants and could have their questions answered immediately. However, some women, mainly those in the workplace, expressed a preference for online classes and having information via texting and the Internet (e-mail). This could be an important medium for providing information to women with GDM and to address their concerns in real time. With technology on the rise in health interventions this is an area that begs for additional attention. When asked what type of support they would like their diabetes educators to provide, some mentioned that they wanted help with accountability through texting. Diabetes educators need to find ways to include technology in diabetes education classes.

Implications for Future Research

This qualitative study presents a better understanding of the experiences of women with GDM and complements the large body of quantitative studies. There is a great need for research on GDM education postpartum. In addition, the benefits of online classes and texting should be explored. It is important that diabetes educators consider offering GDM educational programs at non-traditional times such as on weekends or in the evening for women who work. GDM affects a diverse group of women. Therefore, it is vital to ensure that the classes provide culturally appropriate information. It is important to note that many women prefer to be held accountable for their lifestyle modifications. The use of texting and emailing are two areas that need to be studied as a means of holding patients accountable and as an educational approach.

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