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COLLEGE STUDENTS WITH GLUCOSE DISORDERS AND NUTRITIONAL ADJUSTMENTS

The Effect of Independent Living on College Students' Self-Management of Abnormal Blood Glucose Metabolism Disorders on Nutritional Adjustments

by

Deena Majdi Zahran

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Blood Glucose Disorders and Nutritional Adjustments

Abstract

As a student with a blood glucose metabolism abnormality transitions from living with their guardians to moving out during their college years, he or she also transitions from a formerly dependent lifestyle to new independent lifestyle. This new lifestyle can have an impact on the student’s self-management of their blood glucose abnormality related to how they manage their nutrition on a daily basis. This study identified if these independently living college students with blood glucose metabolism abnormalities were able to efficiently manage their disease based their nutritional choices. This study also identified if positive or negative changes occurred in nutrition in response to managing blood sugar abnormalities along with college life. The participants were between the ages of 18 and 47 years and diagnosed with either type 1 diabetes or hypoglycemia. Of the total participants, two of them were diagnosed with type 1 diabetes, and three of them were diagnosed with hypoglycemia. Each of the five subjects was interviewed regarding their transition from living at home to living independently, while managing their blood glucose abnormality and nutrition. Interviews were conducted face-to-face and lasted about one hour. After both researchers conducted the analysis of all five interviews, it was found that the most common themes that were identified included issues with time management, mom as manager, shift in management, and recognizing shortcomings.

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Introduction

College is most popularly seen as a time of freedom, fun, parties, all-nighters at the libraries, and experimentation; however, college can also be described as a time of danger and an environment of endless risks and peril. College students with abnormal blood glucose metabolism are to be aware of this transition in their lives, and how it can affect their disease management. The purpose of this qualitative research is to identify how leaving the parent's shelter and care into a college environment would affect certain nutritional aspects of the student's disease self-management. The results of this study could provide a broader focus on client teaching provided by the nurse, related to disease management and assist the client to better incorporate day-to-day activities and nutritional choices related to their blood glucose abnormality management.

Diabetes is defined as a metabolic disease in which the body does not produce enough insulin, or the body's cells do not recognize the insulin being produced at all (American Diabetes Association, 2010). There are two generic types of diabetes mellitus: type 1 diabetes and type 2 diabetes. The American Diabetes Association (ADA) describes type 1 diabetes as a metabolic condition in which the body does not produce any insulin (American Diabetes Association, 2010). This would require daily injections or other methods to manually transmit insulin into the body. Only 5% of people diagnosed with diabetes have this type. The ADA (2010) describes type 2 as a condition in which the body either does not produce enough insulin, or the body's cells do not recognize the insulin being produced. This type of diabetes can usually be managed by oral medications, but can also be managed with injections of insulin as well. Type 2 diabetes is considered the most commonly diagnosed type of diabetes. Hypoglycemia is very
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similar to diabetes mellitus type 1, but not as severe in nature, since the body will still make some insulin (American Diabetes Association, 2010). All of these clients will need to keep tight control of their blood glucose involving their diet, medications and lifestyle.

Nutrition plays a vital role in diabetes management, especially in the transition process from living with the parents to living on one’s own. College living is infamous for its sudden decline in nutritious meals and an increase in fast, efficient, accommodating foods such as pizza, chips, and on-the-go cookie snacks. Other barriers to nutritious, healthy meals stem from financial limitations, unavailable resources, and a desperate need to save time. This leads to an unhealthy diet comprised of unhealthy fats, high calorie, high carbohydrate, and high sugar diet. This new regimen plays a disastrous role to the body creating life threatening diabetic complications.

The goal of this study was to identify the college experiences of students with blood glucose abnormalities, and explored how this population manages their disease while adjusting to college life and living independently. This study sought to determine whether this particular sample of students is able to efficiently manage their disease based on stress management and nutritional choices. Inadequate or altered management will be identified within the chosen sample. This study will also identify if positive or negative changes occur in stress management and nutrition in response to managing blood sugar abnormalities along with college life.

Today’s healthcare focuses mainly on the standard topics of blood sugar abnormality management, such as managing lab values, carbohydrate counting, insulin delivery devices, and glucose intake. This study attempted to convey that the recently independent college students managing their blood glucose metabolism abnormalities
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experienced a period of poor management related to adjustments in nutrition due to the transition to college. This will help identify the importance of including an individual’s personal day-to-day choices in evaluating effective disease management. The particular interests in evaluating stress and nutrition related to management can help healthcare providers identify major reasons for inadequate or altered management of blood glucose abnormalities in addition to managing lab values, carbohydrate counting, insulin delivery devices, and glucose intake. This study provided a broader focus on client teaching provided by the nurse, related to disease management and assist the client to better incorporate day-to-day activities and nutritional choices related to their blood glucose abnormality management.

The research question that guided this study is whether there will be a change in a college student’s self-management related to nutrition of their blood glucose metabolism disorder when living independently. The hypothesis therefore is that recently independent college students managing their blood glucose metabolism abnormalities will experience a period of poor management related to adjustments in nutrition. A parallel study using the same participants was conducted by a different researcher interested in the stress management of these same students.

Review of Literature

Typically, the concept of weight gain during the freshman year in college is called Freshman 15. This weight gain could be due to a decrease in nutritious food consumption, a greater consumption in unhealthy food, a sedentary lifestyle, and new stressors related to the college environment. Nutrition is believed to play a key role in this weight gain during the college period. Hajhosseini, Holmes, Mohamadi, Goudarzi,
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McProud, and Hollenbeck (2006) presented a study that supports the concept of weight gain during freshman year of college. They obtained a sample of 27 male and female freshmen students attending San Jose State University (SJSU). The alterations in diet and basal metabolic rate (BMI) of freshmen students were emphasized during the study so as not to focus on changes in body weight. The time period of this study was during a 16-week semester during the freshman year. Hajhosseini et al. (2006) utilized a health questionnaire and dietary records of the selected population to retrieve their data for the study. The study showed that mean body weight increased significantly with time (3.0 lbs; p < 0.001); 16 subjects (59%) gained ≥ 3.0 lbs, while 6 subjects (22%) gained ≥ 6 lbs. Percent fat mass significantly increased (p < 0.001), while lean body mass decreased (p < 0.001) (Hajhosseini et al., 2006). If these results of the study were generalized for any college population, that would then include the diabetic population or a population having abnormal blood glucose metabolism disorders. This would then contribute to the hypothesis that the change in dietary habits during college and entering a new life of independence from parents would affect their self-management of their abnormal blood glucose metabolism disorder.

The transition period that an adolescent with a diagnosed blood glucose metabolism abnormality (such as diabetes type 1, type 2 or hypoglycemia) faces during the first years of college could drastically impact their ability to self-manage their disorder. Students are accustomed to their parent’s guidance with management of blood glucose metabolism abnormalities. Tasks related to this management include simple reminders to check blood glucose levels, dietary advice and rules, and financially taking care of equipment. This parental control reduces stress upon the student, but at the same
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time also reduces knowledge and responsibility related to independent management.

Reyes-Velazquez and Hoffman (2011) and Garvey and Wolpert (2011) address this transitional issue and how it affects diabetic students in a negative way. They introduce the idea that psychological approaches may need to be taken rather than more health care provider check ups. Garvey and Wolpert (2011) concludes that each diabetic person going through the process of transition from pediatric to a young adult needs an individualized care plan that introduces psychological changes, risks and barriers to diabetic management rather than standard management topics. Reyes-Velazquez and Hoffman (2011) addresses targeting the psychological aspect, such as the application of fear, to provide knowledge and awareness about their risks and barriers to their diabetic management during college.

King, Bull, Christiansen, Nelson, Strycker, Toobert, & Glasgow (2007) address the vitality of technology as a means to increase quality of diabetes management during this transitional period for an adolescent entering the young adult years. Both create plans with technology to increase knowledge and act as reminders for the student. King et al. (2004) utilizes the idea of a CD-ROM to focus on aspects of primary care in replacement of an actual health care provider, or as a supplement to the primary health care provider. Carroll et al. (2007) contributed to the idea of technology being an aid to self-management, by suggesting a device that can provide reminders, alarms, communication with the doctor, and past history of blood glucose levels. This would allow the students to gain new responsibilities and trust from their parents, while maintaining a certain social standard in public. This in turn would make checking blood glucose frequently an easier, more convenient practice for the adolescents. Since publication of these resources, many
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technological advances have been developed with more simple and efficient applications to this population.

Garvey and Wolpert (2011) explain the barriers of sufficient diabetes management in the early young adult population. The developmental transition into early young adulthood can cause dramatic changes in glycemic control and average A1C levels. An A1C level is the glycosylated Hgb. It indicates glucose control over previous 120 days, which is the approximate life span of red blood cells. It is a valuable measurement of diabetes control. Psychological changes also play a dramatic role in the changes in diabetes management including changes in perception of responsibility and rejecting parental control. Personal changes in body image and peer pressure in addition to college stressors such as diet and time management can have a direct affect on diabetes management. According to a Canadian survey of young adults with type 1 diabetes (Garvey et al. 2011), 75 participants were asked to prioritize their subjects of interest during their clinical appointments. Topics that would be seen as “standard” topics, such as on intensive diabetes management, insulin delivery devices, and carbohydrate counting, were only selected by about 40% of respondents. The particular interests that occurred most frequently throughout the surveys included: goal-setting with the health care team (71%), stress management (59%), what’s new in diabetes research (79%), sex/pregnancy (53%), financial issues (48%), and alcohol and drugs (45%). Garvey et al. (2011) concludes that each diabetic person going through the process of transition from pediatric to a young adult diabetic care provider needs an individualized care plan that introduces risks and barriers according to their developmental stage rather than the standard topics of glycemic control and regular check-ups.
Reyes-Velázquez and Hoffman (2011) conducted a study in order to obtain college students' perceptions of type 2 diabetes and experiment with different prevention messages that would mostly appeal to the college students, such as the fear appeal and positive affect. Reyes-Velazquez and Hoffman (2011) interviewed college students who did not have type 2 diabetes and were generally asked about their perceptions of the symptoms, causes, and prevention methods the disease. Reyes-Velazquez and Hoffman (2011) address the lack of general background knowledge about the disease and the need to better inform the college student population. One aim of this study was to indicate that all college students were at risk for development of type 2 diabetes due to lifestyle changes, such as diet and exercise. Reyes-Velazquez and Hoffman (2011) suggest that the application of a fear appeal would produce desirable effects if the message included a threat, pertinence to the participant, and solutions that can easily be performed by the participant. Diversity in geographical regions is also suggested by Reyes-Velazquez and Hoffman (2011) for future implementation. Reyes-Velazquez and Hoffman (2011) use an excellent example as to how little the college population understands type 2 diabetes. This lack of knowledge about the disease could prevent the students from taking steps to improve their lifestyle.

King et al. (2004) discuss the utilization of Interactive Health Technologies (IHT) as a means for self-management assistance for patients with type 2 diabetes either as an additional tool to clinical appointments or as a stand-alone program. King et al. (2004) discuss the use of a CD-ROM tool in their study in order to answer the research question of whether this tool is sufficient enough to address key barriers in self-management of diabetes in primary care. King et al. (2004) developed a study which consisted of two
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programs: Diabetes Primary Programs (DP) and Diabetes Health Connection Study (DHC). The DP focused mainly on the primary care of the patient by programming the CD-ROM to help patients create an individualized action plan to aid in self-management of their diabetes. The program assessed, advised, and gave a list of barriers that could hinder effective self-management (assisted). King et al. (2004) suggested the program DHC as a way of connecting self-management to primary care. This program allowed for evaluation of diet and exercise to develop a proper action plan, and it focused on the patient's social support system as well. Although King et al. (2004) expressed many advantages to the CD-ROM as an alternate route to managing diabetes and gathering advice and assessments, the CD-ROM approach eliminates that critical one-to-one confrontation with a healthcare provider and creates a less individualized plan for adapting to their own changes in their personal lifestyle choices.

Carroll et al. (2007) contributed to the idea of technology being an aid to self-management of type 1 diabetes; however, in this case, the focus was more on blood sugar testing. The researchers utilized a focus group methodology and qualitative inquiry to obtain personal opinions from two groups, adolescents and their parents, concerning whether mobile monitoring of blood sugar levels would decrease certain barriers adolescents have in self-monitoring their blood glucose at the appropriate times. The researchers conducted ten focus groups, five groups consisting of adolescents and five other groups consisting of parents, with a total of 59 participants. The qualitative analysis revealed themes, such as issues with blood glucose monitoring, compliance with diabetic regimen, parent-child relationships, desired technology, and communication (Carroll et al., 2007). Caroll et al. (2007) concluded that the adolescents in the study desired a
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Technological advancement allowing their blood glucose monitoring system to blend in with their social surroundings. This allowed the students to appear “cool”. Participants portrayed an interest in integrating their information directly with the healthcare system as a way to communicate their results. Carroll et al. (2007) is an excellent example of adolescents desiring to self-manage their care without the constant input and control of their parents. Gaining new responsibilities and trust from the parents, while maintaining a certain social standard in public, would make checking blood glucose frequently an easier, more possible outcome for the adolescents.

Laing, Jones, Swerdlow, Burden, and Gatling (2005) described the correlation between psychosocial and socioeconomic factors and premature death in young diabetic patients. Laing et al. (2005) defined “young” as under the age of 40. People under the age of 30 were found more likely to die of acute events related to diabetes rather than long term complications of diabetes. Laing et al. (2005) recruited participants from the Diabetes United Kingdom to register for the study resulting in greater than 23,000 cohorts diagnosed with diabetes under the age of 30. In total, there were approximately 146 cohort deaths that were analyzed according to two separate categories: acute event related to diabetes or chronic complication of diabetes. Among the cases there were 51 deaths from acute causes, which included 24 acute complications of diabetes but also deaths from accidents (15 deaths) and suicides or possible suicides (12 deaths). Chronic conditions related to diabetes accounted for 34 of the deaths (22 from cardiovascular disease and 12 from renal disease), and the remaining 13 deaths were not considered to have any association with diabetes and included deaths from cancer, gastric complications, and respiratory diseases (Laing et al., 2005). Acute diabetes-related
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events, such as ketoacidosis, were responsible for the greatest number of deaths in early adulthood. Psychosocial factors were much more closely associated with deaths due to acute events than chronic complications. Living alone, a past history of drug abuse, and previous psychiatric referral were shown to be related to deaths from acute events and have not previously been identified as risk factors for all-cause mortality. Laing et al. (2005) considers identifying the high risk group of young adults by recognizing psychosocial and socioeconomic factors of the patients: young and of the male sex, a low socioeconomic background, living alone, a history of drug abuse, and past psychiatric problems. These groups are particularly vulnerable and would merit specific research and clinical attention.

The lack of knowledge portrayed by the students interviewed within these studies about their own blood glucose abnormalities triggered an interest into finding the cause of such a knowledge deficit and lack of adequate self-management. It appears that an important transition period within an adolescent’s life when entering the college world places the adolescent at a critical position in making independent decisions about their disorder, forcing them to deal with the issues of their disorder that they may have not noticed beforehand. The new environment along with an altered nutrition may play a vital role in why that lack of self-management exists within a population of college students who have just moved out of their parent’s home.

Methods

Subjects volunteered their participation and provided contact information to one of the student researchers. Participants’ contact information was entered into a secure computer with a password until interviews were scheduled to begin. All participants who
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provided contact information were contacted and were provided consent for a face-to-face interview (see Appendix A). Each interview lasted approximately one hour and was located in various locations across the university’s campus. See Appendix B for the interview guide. It took about two weeks to contact each participant to schedule interviews after compiling 5 participants. Each participant were reminded of their interview at least two days before their scheduled day. Interviews consisted of questions addressing two research questions: 1) stress management, related to a parallel study and 2) nutrition, related to this study (See Appendix B). Before each interview, each participant received a copy of an interview guide. This guide provided the participant the questions that they were asked of by the interview conductors. This guide was given right before each interview allowing the participants to identify the questions that may make them uncomfortable to answer during the actual interview process. Tape recorders were used to ensure accuracy of the interpretation of data, since interpretation occurred several weeks after the initial interviews. After all the interviews were completed, both researchers involved in the parallel studies compared results from their interviews indicating similar, frequent themes of the interview data. The qualitative data was interpreted by both researchers to maintain an unbiased evaluation. The relevant and irrelevant data for each researcher was separated and applied to the specific research topics. Both researchers then reported their findings separately. Analysis was conducted within one month after completion of all scheduled interviews.

Results

The sample population consisted of five participants. The sample group consisted entirely of female participants, no male participants. The participants were between the
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ages of 18 and 47 years and diagnosed with either type 1 diabetes or hypoglycemia. Of the total participants, two of them were diagnosed with type 1 diabetes, and three of them were diagnosed with hypoglycemia. Demographic data of the participant group is presented in Table 1. The most common themes that were identified after analysis of participant interviews included 1) time management, 2) mom as manager, 3) shift in management, and 4) recognizing shortcomings.

Time Management

Subjects expressed the concept of time as a common barrier to three sub-elements within the theme time management. These elements were: eating more nutritiously, using coping mechanisms for stress, and generally managing their blood glucose abnormality related to scheduling.

Eating more nutritiously. Time management has shown to affect the participants' nutritional decisions after they have moved away from their parents and become more independent. The time to prepare nutritious meals becomes a barrier, resulting in unhealthy nutritional choices such as microwavable, canned, and fast foods. One participant stated, “It gets a lot harder, when I have to find something to eat quickly between classes. So finding time is harder, and sometimes we run out of food at the dorm...” Another participant also claimed, “I have this new obsession with Starbucks, and I eat out with my friends a lot more than before. Plus, when I don’t have enough time to eat because of a test I need to study for, I’ll usually make something really fast and unhealthy to eat like a bag of chips, popcorn, ice cream, stuff like that.”

Using coping mechanisms for stress. The struggle to find time to self-manage blood glucose metabolic disorders impacted the majority of the participants’ manner of
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coping with stress. Throughout the interviews, the participants expressed a decrease in stress management after moving away from their parents, although expressing that they experience more stress compared to living with their parents. On the other hand, participants expressed that was less difficult to find time to manage stress while living with their parents. One participant specifically said, “Well, I don’t meditate as much as before. There’s just not enough time. But I do exercise maybe twice a week at the UC.”

Stress management also impacted nutritional choices, as well. “Yeah, I get more stressed out, and I tend to eat out with my friends a lot more. I would get kind of embarrassed to say no to some foods, but I still try to be very careful.” Another participant explained, “Sometimes I eat a lot more than I should. I know I should develop better ones, but I never have the time.”

Managing blood glucose abnormality related to scheduling. When living with parents, participants indicated that they visited their healthcare provider at a regular, maintained schedule, which usually involved collaborating with parents. On the other hand, when living away from parents and carrying an increased amount of responsibility for their schedules and appointments, the participants expressed a difficulty in keeping a regular, maintained appointment schedule with their healthcare provider as they did before they moved away from their parents. One participant claimed, “It gets harder to see him (healthcare provider). Actually, I postponed my appointment for the third time yesterday because of my classes and clinicals. Scheduling an appointment is way harder than before when I would just rely on my mom to schedule my appointments.” Another participant also claimed, “Yeah, same one but recently it’s been difficult to keep up with appointments because of classes and stuff.”
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However, some participants differed in the frequency in which they visited their healthcare provider. The type 1 diabetics presented a more frequent visitation with their healthcare provider, while participants diagnosed with hypoglycemia presented with a more flexible and less frequent visitation schedule with their healthcare provider. Within the recorded interviews, the participants that were diagnosed with type 1 diabetes complained about scheduling difficulties with their healthcare providers due to their time management.

Mom as Manager

The mother of the subject was most often identified as the primary manager of the blood glucose abnormality while living at home. The mother continued to be involved after the transition to independent living. Before participants moved away from their parents, the mothers were involved with primary management, financial management, nutritional management, and as a member of the participants' support systems. The mothers aided in simple tasks such as reminding their daughters to check their blood sugars throughout the day. “When I’m at home, my mom reminds me to check my blood sugar a lot.” As a support system, the participants claimed that their mother provided them with strong support even after they have moved to college. “…my mom helps me out a lot. She was always there anytime I needed anything. So it was easy to rely on someone other than me.” “I still call my mom, and my mom still calls me to make sure I’m doing ok. She’s still a great help.” Financially, the mother (parents) is still primarily responsible for the financial management of the participants’ diagnoses, in addition to aiding in purchasing groceries or providing money to the participant for groceries. “My mom and dad give me money and they still provide me with groceries every week. I also
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have that $200 meal plan which lets me get food from Chick fil-a and the convenient store downstairs”.

Shift in Management

Subjects were learning how to better manage their blood glucose abnormality. They focused more on symptom treatment rather than prevention. There was a general decrease in the management quality of their disease. Participants were better able to recognize their symptoms as they became more independent living away from their parents. Although participants were improving in their awareness of physical warning signs, participants also described a decline in general management, such as nutritional choices, scheduling blood sugar readings, and overall outcomes of their disorder. Some comments included: “I have more spells than I did when I lived at home. I don’t really have time to monitor as much. I have about 2-3 spells every week, but they were very rare when I lived at home.” “I try to make sure I check my blood sugar before and after I eat, but it gets difficult to do that because of classes and eating out with friends.” “Well, I’m a lot better at telling whether I’m getting too low or too high. I’m also getting better at checking my blood sugar by following a schedule. But it gets harder whenever a new semester starts, because the schedule gets messed up and I have to get used to it all over again.”

The slight increase in average blood sugars described by the participants that were required to check their blood sugars throughout the day, contributed to the overall decline in management. “…around 70-80. I’ve actually been a little bit more on the high side than when I lived with my family.” “Ummm, I think it would be around 120-160. It goes
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up more often than usual now that I live on my own.” “Ummm 100-160. Its higher now than before.”

Recognizing Shortcomings

Subjects reported that they have enough knowledge for how to prevent and manage their blood glucose abnormalities and stress of college life; however, they did not always apply this knowledge to their daily life. Participants shared their personal knowledge about the interventions that are required of them related to certain aspects of their diagnosis; however, they admitted to difficulties following that knowledge. Participants discussed “embarrassment” and “eating out with friends” as a set back to their self-management of blood glucose metabolism disorders. “I would get kind of embarrassed to say no to some foods, but I still try to be very careful.” Other comments included: “I know I should develop better ones (coping mechanisms for stress), but I never have the time.” “Since school started I haven’t been eating the right things and that makes my blood sugar get too high.” “I still eat candy when I’m too low. I know it’s not the best choice, but it’s my go to food when I’m low. I’ll try to change to crackers... maybe.”

Discussion

This study used qualitative research to examine the effect of independent living on college students’ self-management of abnormal blood glucose metabolism disorders on nutritional adjustments. Blood glucose metabolism abnormalities within the research study included hypoglycemia and type 1 diabetes. These disorders require imperative management, whether the management was primarily coming from parental figures or from the individual with the disorder. As a college student made the transition from
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living at home to living on their own, some aspects of their self-management of their blood glucose abnormality changed, specifically their nutritional decisions. Their transition allowed the college students to accept greater responsibility for their blood glucose abnormality management while still needing assistance from their parental figures.

The conducted research involved four essential themes indicated throughout the participant interviews related to time management, mom as manager, shift in management, and recognizing shortcomings. The themes, as well as subthemes under time management, displayed the most common issues expressed during the five participant interviews affecting the participants’ self-management of their blood glucose abnormalities as they become more independent.

Most of the college student participants indicated that time management was a barrier to effectively self managing their blood glucose metabolism abnormalities. Issues such as eating more nutritiously, using effective coping mechanisms for stress, and managing blood glucose abnormality related to scheduling appointments with health care provider affected their self management as well. The struggle in finding time to cook or prepare a nutritious meal between classes or a night before an exam hindered the participants in making nutritional decisions throughout their daily lives at school. Following their usual stress management techniques that they had previously relied upon when living at home with their parents also became a struggle to maintain when living away from parents due to time management. Even finding time to “meditate” became an issue when juggling with class work, social life, and basic activities of daily living. Efficient time management also affected check ups and appointments with the health care
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provider. This had an immediate effect on the general management of the blood glucose metabolism abnormality, such as keeping up with A1C levels, blood glucose patterns, medical advice on how to improve upon current management of the disorder, and new updates on improved treatment options.

Most of the college participants also expressed that their mothers play a vital role in their management of their blood glucose metabolism now and while they lived with their parents. This could be due to the struggle of adapting to the transition of life with parents to a more independent lifestyle. According to the interviews, it seems like becoming fully responsible of one’s own management almost suddenly would pose as a struggle, and allowing a mother to stay involved with management would allow for a smoother, more adaptable transition for the college students. The mothers stayed responsible with the financial aspects, stayed in touch with the participants making sure they were handling their disorder effectively, and played a vital role in providing food sources and money for their food.

Although the participants began to better able recognize their physical symptoms when their blood sugars reached a dangerously high or low level, the participants also exhibited a general decrease in the management quality of their disease. The participants expressed higher blood sugar levels due to unhealthy nutritional choices since they moved away from their parents. “Eating out with friends”, classes throughout the day, not having enough resources or time to prepare a meal, and making poor nutritional choices contributed to the general decrease in the management quality of their disease. A question of priorities was brought up as the participants admitted to making poor nutritional decisions. Subjects based their choices on being “embarrassed” around their friends if
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you did not choose to eat what their friends ate. The participants seemed to care more about what their friends thought about them compared to the vitality of their nutritional choices on their physical health. This became apparent when one of the participants explained that she was uncomfortable telling anybody, not even her friends, about her disorder. If an emergency were to happen to this participant when she was out with her friends, her friends would not have the adequate knowledge or awareness of the student's disease, which may lead to disastrous consequences for the participant.

Lastly, most of the participants also suggested a common theme of recognizing their shortcomings. The participants seemed to realize that although they knew what healthy food choices to make, they recognized that they did not successfully follow them. They used phrases such as “I know I should but…” and “I’m trying to do better”. A need for education may not be the participants’ biggest issue. The participants clearly expressed that they had an adequate amount of education about their disorder; they simply did not have a successful method of carrying out that education throughout their daily lives. This could also play a role in the question of priority. Is the management of their disease top priority related to their overall general health and wellbeing? As the participants gradually progressed further from the transition of living with parents to living away from parents, the need to prioritize self-management of their blood glucose metabolism abnormality may become more important as they gain more experiences living independently.

The current study provided an opportunity to improve the self-management of blood glucose metabolism abnormalities in college students, and find methods to aid them in better managing their disorder on their own, and gaining that confidence to take
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full control of their management. It also provides an opportunity to find the gaps of nutritional management and fill those gaps with different methods on finding easy, quick ways to prepare healthy meals that are both convenient and not costly. To improve on this current study, more questions should be included in the interviews about alcohol consumption, energy drinks, and coffee intake. For future reference, the term “support system” mentioned within the interview should be further explained as “people/person that you would go to first if you experience a problem, concern, or for emotional comfort.”

Limitations

As with most research, there are limitations in the demographics of the study, time of the study, and geographical location of the study. Demographically, the sample consists of five participants. The sample was all female. There were no males in this study, despite efforts to recruit both genders. The participants were also all Caucasians, despite efforts to recruit a more diverse sample population. This imbalance prohibited the sample from becoming an accurate representation of the overall general population. Another limitation exists within the time of the study. We conducted the study during the students’ spring semester. This permitted most students being interviewed to have already become situated and to better adapt to the stressors associated with college. In that case, newfound issues with nutrition habits and stress management may have been altered since their fall semester. This is also a busy time for students as the year is finally coming to an end. The geographical location of the study also allows for limitations. Since the study is located in Alabama, ranked number four in obesity in the nation, this study would not represent the general population fairly in dietary habits and physical activity.
References


# Blood Glucose Disorders and Nutritional Adjustments

## Table #1: Demographics of Sample Population

<table>
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<th>Subject</th>
<th>Age</th>
<th>Sex</th>
<th>Current Year in College</th>
<th>Year of Admission</th>
<th>Diagnosis</th>
<th>Race</th>
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<td>Female</td>
<td>Freshman</td>
<td>2012</td>
<td>Hypoglycemia</td>
<td>Caucasian</td>
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<tr>
<td>2</td>
<td>18</td>
<td>Female</td>
<td>Freshman</td>
<td>2012</td>
<td>Type 1 Diabetes</td>
<td>Caucasian</td>
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<tr>
<td>3</td>
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<td>Junior</td>
<td>2010</td>
<td>Type 1 Diabetes</td>
<td>Caucasian</td>
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<tr>
<td>4</td>
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<td>Junior</td>
<td>2012</td>
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</tr>
<tr>
<td>5</td>
<td>47</td>
<td>Female</td>
<td>Senior</td>
<td>2010</td>
<td>Hypoglycemia</td>
<td>Caucasian</td>
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</tbody>
</table>
Appendix A:

INFORMED CONSENT

Because you are a college student with blood sugar abnormalities, such as diabetes or hypoglycemia, you are being asked to participate in a research interview. The purpose is to investigate the management of these blood sugar abnormalities by college students. This interview will take about 1 hour or less to complete depending on the length of your answers. It includes questions asking for background information about you.

I will protect and keep confidential all the information you give me. The interview will not contain details that identify you by name. I will keep your interview recording secure and separate from your consent form.

My co-investigator and faculty advisors will have access to your interview recording. If this study is published, information that could identify you will not be used. Some foreseeable risks that pertain to the study include a risk in identity release, uncomfortable topics during the interviews, and/or scheduling conflicts for interviews. You may skip any questions that make you uncomfortable. There are no personal or direct benefits if you participate. However, if you participate, it will help me with my research.

You may contact my co-investigator or me if you have any questions or concerns about this study. Email Elizabeth Hale at eah0003@email.uah.edu or call 256-679-8376 (cell number). Email Deena Zahran at dmz0001@uah.edu or call 256-617-0475 (cell number). My supervisor is Ms. Rebecca Davis. You may contact her at 256-824-2438 (UAH) or Rebecca.Davis@uah.edu.

If you have any questions about your rights while taking part in this study, you may go to www.uah.edu/IRB/index.php. The IRB is a group of people who review research studies to protect your rights.
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Participation in this study is voluntary and you do not have to complete an interview. This research is part of my studies at UAH. It has no effect on your classes at the University of Alabama in Huntsville. You may choose not to participate at any time. About 10-20 people will participate in this study.

If you wish to be included in this study, please sign below

______________________________  __________
Participant's Signature for Consent  Date

______________________________  __________
Researcher Obtaining Consent  Date
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Appendix B

Interview Guide

Demographic Information:

Date of Interview:
Age:
Sex:
Current Year in College:
Year of College Admission:

Blood Glucose Metabolism Abnormality Diagnosis:

Other Diagnoses:

Interview Questions: How does living independently without guardian assistance and supervision affect blood glucose abnormality self-management?

1. Background: When you were living at home:

   a. What would your priority action normally be when your blood sugar is too high?
   b. What would you priority action normally be when your blood sugar is too low?
   c. If blood sugar is low, what would you normally eat?
   d. What were your usual methods of remembering to test your blood sugar routinely?
   e. Who has primarily managed your blood sugar abnormality?
   f. Do you have a primary healthcare provider? If so, how often do you follow-up with your healthcare provider about managing your blood sugar abnormality?
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g. Who is in charge of the financial management of your blood sugar abnormality, such as medications, supplies, doctor visits?

h. What would you consider your average blood sugar range to be?

i. Name some of your coping mechanisms dealing with stress when you were still living at home?

j. How would you describe your support system (family, friends, peers) that is familiar with your health condition?

k. In your opinion, was your diet considered to be nutritious?

l. What would you regularly eat on a typical day when living at home?

m. How would you typically obtain that food?

n. Do you have ready access to your food?

2. Present: Living away from home

a. “In general, how has your blood sugar abnormality self-management changed since you have moved out of your parent’s home?”

b. What is your priority action when your blood sugar is too high?

c. What is your priority action when your blood sugar is too low?

d. If blood sugar is low, what would you normally eat?

e. What are your usual methods of remembering to test your blood sugar routinely?

f. Who is primarily managing your diabetes?

g. Do you have a primary healthcare provider? If so, how often do you follow-up with your healthcare provider about managing your diabetes?

h. Who is in charge of the financial management of your diabetes, such as medications, supplies, doctor visits?
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i. What would you consider your average blood sugar range to be?

j. Name some of your coping mechanisms dealing with stressors of college?

k. How would you describe your current support system at college (family, friends, peers) that is familiar with your health conditions?

l. In your opinion, is your diet considered to be nutritious?

m. What would you regularly eat on a typical day when living on your own?

n. How would you typically obtain that food?

o. Do you have ready access to your food?

p. Does the burden of food preparation impact nutritional choices?
Dear Deena, Elizabeth, Dr. Adams, and Mrs. Davis,

As chair of the IRB Human Subjects Committee, I have reviewed your proposal, *The Effect of Independent Living on College Students' Self-Management of Abnormal Blood Glucose Metabolism Disorders on Stress Management and Nutritional Adjustments*, and have found it meets the necessary criteria for expedited review according to 45 CFR 46 and continuation. I have approved this proposal, and you may commence your research. Please note that this approval is good for one year from the date on this letter. If data collection continues past this period, a renewal application must be filed with the IRB.

Please contact me if you have any questions.

Sincerely,

Pam O'Neal PhD, RN
Associate Dean for Undergraduate Programs
IRB Chair
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phone: 256.824.6742 and fax: 256.824.2850