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

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

by

Elizabeth Anne Hale

An Honors Thesis

submitted in partial fulfillment of the requirements

for the Honors Diploma or Certificate

to

The University Honors Program

of

The University of Alabama in Huntsville

April 24, 2013

Abstract

The transition to college life has always been full of challenges and stress, which has an effect on someone managing blood glucose abnormalities. This study began to identify the college experience of students with blood glucose abnormalities, and determined how they manage their disease while adjusting to college life and living independently. A sample of five college students with blood glucose disorders was recruited voluntarily. Each subject was interviewed face-to-face regarding their transition from living at home to living independently, while managing their blood glucose abnormality and stress. The data was then evaluated by two researchers. The five themes identified by the two student researchers were Recognizing Shortcomings, Time Management, Mom as Manager, Shift in Management... Not There Yet, and Stress Management: Not a Priority. There are many implications for nursing practice that can be derived from the information collected in this study. These include strategies to remember to check blood glucose, improved coping mechanisms, and greater independence before the transition to college.

Honors Thesis Advisor: Ms. Rebecca Davis

Advisor's title: Clinical Instructor

Advisor: *Rebecca Davis RN, MSN* **Date:** 04-23-2013

Department Chair *Chad Hyatt* **Date:** 4/23/2013

Honors Program Director *Hyatt* **Date:** 4-25-13

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Table 1: Demographics of Sample Population

[The content of this table is extremely faint and illegible. It appears to be a demographic table with multiple columns and rows, but the specific data points cannot be extracted.]

Introduction

The transition from high school to college life has always been full of challenges and stress. This time has been overflowing with new experiences, responsibilities and opportunities that have the ability to change the direction of a person's life. A move from home, occurring at any point in this experience, would compound this stress even further. Many sudden changes would have an effect on a healthy person, let alone someone also managing a chronic disease, such as blood glucose abnormalities including diabetes and hypoglycemia. Diabetes mellitus is a disease with two types where the body produces insufficient insulin or is resistant to insulin that is produced. Type 1 diabetes mellitus (T1DM) occurs when the pancreas cannot make enough insulin to balance glucose, especially when the client has just eaten. Clients with Type 2 diabetes mellitus (T2DM) develop diabetes related to a number of risk factors, including obesity, high blood pressure and other metabolic conditions. Hypoglycemia is very similar to T1DM, but not as severe in nature, since the body will still make some insulin. All of these clients will need to keep tight control of their blood glucose involving their diet, medications and lifestyle.

Stress is any experience or circumstance that threatens an individual, causing a physical and emotional response that may drive or inhibit one's performance (Behere, Yadav, & Behere, 2011). The body reacts with the same sympathetic response, whether the stressor is chronic or acute. This biological response can cause serious health repercussions from migraines to heart disease, insomnia to ulcers (Behere et al, 2011). These concerns, which may occur even in otherwise healthy clients, make the management of a chronic illness such as diabetes even more difficult. Increased blood glucose and insulin resistance can develop as part of the influence of stress on the body (Rosenzweig, Reibel, Greenson, Edman, Jasser, McMearty, & Goldstein,

2007). Therefore, these responses to stress by the body can have an even more serious effect on a diabetic person than a healthy person.

The purpose of this qualitative study was to identify the college experience of students with blood glucose abnormalities, and how they managed their disease while adjusting to college life and living independently. This study sought to determine if this particular sample of students was able to efficiently manage their disease and made effective stress management choices.

Inadequate or altered management was identified within the chosen sample. This study also sought to identify if positive or negative changes occurred in stress management in response to managing blood glucose abnormalities along with college life. Today's healthcare focuses mainly on the standard topics of blood glucose abnormality management, such as managing lab values, carbohydrate counting, insulin delivery devices and glucose intake. This study sought to identify the importance of including an individual's personal day-to-day choices in evaluating effective disease management. The particular interests in evaluating stress 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. A parallel study using the same participants was conducted by a different researcher interested in the nutritional management of these students. This study answered the research question: What is the lived experience of University of Alabama in Huntsville students with blood glucose metabolism abnormalities who have recently begun living independently related to stress management? The hypothesis was that recently independent college students managing their blood glucose metabolism abnormalities will experience a period of poor management related to new college stressors due to the transition to college.

Review of Literature

Diabetes is one of the most prevalent chronic diseases in the United States (US) and the seventh leading cause of death in the US. In 2007, the Center for Disease Control and Prevention (CDC) reported that the average cost of diabetes was \$174 billion in the US. The fastest growing group of diabetics is young adults, where the disease is more aggressive when compared with older adults (Seo, Torabi, Li, John, Woodcox, & Perera, 2008). These numbers would be even larger if hypoglycemia was included as well. Due to its importance in today's health care, there is a wide range of literature on diabetes mellitus literature in the academic world. Health care providers and other researchers have been working together to move toward better management and patient care for this large aggregate of patients.

Stress can be detrimental to the health of a patient, especially if that patient is already vulnerable to the complications that stress will aggravate. Diabetes mellitus and hypoglycemia can cause someone to become vulnerable to these complications. An infinite number of factors can cause stress in a person, but some factors will produce some stress in most people. Anderson, Holmbeck, Iannotti, McKay, Lochriei, Volkening and Laffel (2009) found that the transition of diabetic management from the parent of the patient, to the patient can be a tumultuous period for the family as they redefine responsibilities of their members. This example is helpful when addressing the transition from living at home, to independent living at college for a diabetic student.

Most college students are at an age when health concerns can take a lower priority. The majority can still compensate well for some unhealthy behaviors that cause long term consequences. The attitudes of college students often do not match their actual level of risk, as discussed in Seo et al. (2008). The researchers found that the three factors of higher body mass

index (BMI), pre-diabetic status and unknown blood glucose level best predicted increased awareness of developing diabetes. Seo et al. (2008) emphasized the need of health care providers to better educate college students as a group on their risk for developing T2DM now, not just when they get older.

Diabetics and college students are both populations that have an increased level of stress. Gois, Dias, Raposo, Carmo, and Barbosa (2012) and Rosenzweig, Reibel, Greenson, Edman, Jasser, McMearty and Goldstein (2007) described the effects of stress on diabetic patients and offered some methods on how to reduce that stress. Gois et al (2012) used questionnaires and interviews to determine whether or not increased vulnerability to stress, anxiety, or depression affected metabolic control in T2DM patients. The outcome for their study was that depression did have an association with worsened metabolic control, but stress and anxiety had no effect on their own. Rosenzweig et al. (2007) enrolled clients in a program for stress reduction in hopes of developing better stress management in T2DM clients. At the one month follow up, the authors found decreased glycated hemoglobin (HbA1C) and mean arterial pressure levels; however, body weight did not change.

In addition, Behere, Yadav, and Behere (2011); Zullig, Teoli, and Ward (2011); and Bhandari (2012) all address the life of stress associated with the college years. Behere et al. (2011) researched stress among undergraduate medical, engineering and nursing students. The researchers concluded that even though stress is often ignored or accepted as a normal part of college life, students continue to experience it to a degree that may require clinical attention. Therefore, it is very important to be able to teach students to recognize and employ coping mechanisms to deal with this stress. Zullig et al. (2011) examined the relationship between health related quality of life and life satisfaction of college students with developmental assets. This

research suggested that high future aspirations and developing non-parental role models may actually decrease the health related quality of life (HRQOL) instead of increasing it among college students. However, better family communication was associated with higher life satisfaction. Bhandari (2012) studied a convenience sample of 130 Nepalese students in South Korea to assess their perceived and acculturative stress. The researcher found that international Nepalese students do experience considerable stress when studying in South Korea.

The combination of factors discussed in the literature should be addressed and studied to assess how college students living independently change their coping with stress and management of diabetes. There is a great amount of literature that discusses aspects of diabetes, college life, stress, and management of diseases, but none address all four factors. The studies were applicable, but there is still a gap in the literature of diabetic and hypoglycemic college students under stress. There were not any studies about hypoglycemia that were relevant to the topic of the current study. However, the information about diabetes can be easily applied to hypoglycemia, as hypoglycemia is a type of precursor to diabetes mellitus. This study will seek to begin to fill in these gaps.

Methods

The sample for this study included five University of Alabama in Huntsville students, with blood glucose metabolism disorders such as T1DM, T2DM, and hypoglycemia. Students were living away from home for the first time, either in a college dorm or apartment. The sample included only females. Subjects were made aware of the study through announcements by the student researchers at several college events including honors freshman open house, nursing orientation day, a research event at the Von Braun Research Hall, and partnering with the psychology department to offer the study as an option for an activity in class. After becoming

initially aware of the study, subjects were allowed to contact either one of the student researchers face-to-face or by email to volunteer to participate in the study.

Students who chose to volunteer their participation were provided with the contact information of the student researchers. Participants' contact information was then gathered and entered into a secure computer with a password until interviews were scheduled to begin. All participants who provided contact information were contacted and asked to collaborate with one of the two student researchers to schedule a time for a face-to-face interview. Each interview lasted approximately one hour and was located in the university's library. The interviews for each participant were held within the same month. Each participant was reminded of their interview at least two days before their scheduled day. All interviews were conducted approximately one month after date of recruitment. Interviews consisted of questions addressing two research questions: 1) stress management, related to this study and 2) nutrition, related to a parallel study (See Appendix A). 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, each interview was transcribed, and data was compared by this researcher and the parallel researcher to verify similar, repeated themes. 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. All recordings and field notes were destroyed following analysis.

Subjects were given an interview guide before their interview to obtain an idea of what type of questions would be asked of them. This allowed for achievable rapport with each student

in order to obtain the most accurate information. Subjects were also given a consent form (See Appendix B). Institutional Review Board (IRB) approval was obtained for this study from the University of Alabama in Huntsville Review Board prior to the recruitment process. See Appendix C for a copy of the IRB approval letter.

Results

The data collected from the interviews yielded many themes. The student researchers identified five commonly repeated themes in the larger amount of data generated by the interviews. The five themes were as follows: 1) Recognizing Shortcomings, 2) Time Management, 3) Mom as Manager, 4) Shift in Management... Not There Yet, and 5) Stress Management: Not a Priority. Each theme was supported with statements made by different subjects throughout the interview process. Three of the most representative statements were included as examples for the purposes of this research report. Demographics of this study included all Caucasian females. There were two freshman, two juniors and one senior in the sample with ages ranging from 18 to 47. Three of the subjects had hypoglycemia, and two had T1DM. Demographics for the sample of subjects can be found in Table 1.

The theme of Recognizing Shortcomings was created due to subjects reporting that they had enough knowledge for how to prevent and manage their blood glucose abnormalities and the stress of college life; however, they did not always apply this knowledge to their daily life. One subject reported, "I know I should develop better ones (coping mechanisms for stress), but I never have the time." Another subject explained, "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," admitted one subject.

Time Management was used to identify that subjects expressed the concept of time as a barrier to eating more nutritiously, using coping mechanisms for stress, and generally managing their blood glucose abnormality. A subject very clearly stated, "Just a lack of time is the hardest to deal with." Another confirmed, "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..." This theme was verified by a third report of, "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."

The most recurrent theme for management style before college life was 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. "When I'm at home, my mom reminds me to check my blood sugar a lot," stated one subject. In another representative statement, a subject said, "...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." A third explained even after the transition to college life, "I still call my mom, and my mom still calls me to make sure I'm doing ok. She's still a great help."

Subjects were learning how to better manage their blood glucose abnormality. They focused more on symptom treatment than prevention. There was a general decrease in the management quality of their disease. This theme was labeled Shift in Management... Not There Yet by the student researchers. This theme was explained well by the account, "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,” reported another subject. Another confirming description was, “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 final theme was called Stress Management: Not a Priority. For this theme, subjects identified more stress since beginning college. However, they did not develop improved management skills and used their previous coping mechanisms less often. Describing a decrease in stress management, one subject 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.” Another confirmed, “Yeah, I get more stressed out, and I tend to eat out with my friends a lot more.” The last example clarified, “Well, my stress has definitely gone way up since college, especially since nursing school. I don’t do anything different to deal with it though. Sometimes I eat a lot more than I should.”

Limitations

This study only included college students from the University of Alabama in Huntsville, no other locations. This limited population means that the results of this study were not able to be generalized to other colleges or populations. The goal of the different recruitment strategies were to include as many students as possible, but some students may still not have had an opportunity to see and participate in the study. There were no males in this study, despite efforts to recruit both genders equally. The participants were also all Caucasians, despite efforts to recruit a diverse sample population. The demographics and number of each blood glucose abnormality depended on voluntary response of the participants, and therefore a sample representative of the

general population may not be obtained. Both researchers involved in the collection interpreted the data; however, since both researchers are nursing students, some bias may still have entered into the data analysis. One interview was not recorded using a tape recorder, so only field notes were used to reconstruct the interview. The interview was summarized with as much detail possible immediately after the interview to maximize accuracy of the interview.

Discussion

Many implications for nursing practice can be derived from the information collected in this study. Practical needs that were identified included remembering to check blood glucose levels, and consistently using effective coping mechanisms when faced with increased stress. The participants identified a number of strategies for remembering to check blood glucose levels to include phone or insulin pump reminders, and making notes. However, these strategies were not recognized as effective by the subjects who used them. Subjects could benefit from a more organized and purposeful approach to monitoring blood glucose levels, such as a phone app specifically for remembering and even recording blood glucose levels. Stress management was inconsistent at best for the majority of subjects in the study. Some continued with activities, such as exercise, to decrease stress, but most admitted to using them less despite self-reported increase in stress. A greater understanding of how to create and maintain coping mechanisms despite stress could increase the effectiveness of other aspects of blood glucose management.

The themes of Recognizing Shortcomings and Time Management revealed that most subjects had the knowledge base to equip them in managing their disease and stress at a higher level. They knew what the right answer was, but they did not necessarily act consistently on what they knew. Every subject made statements indicating that when a lack of time occurred, disease management suffered. Most of these everyday problems could be handled, or even eliminated, if

the subjects had prioritized and taken time to manage their abnormality using their knowledge base. This leads to the very complex issue of how to instill health beliefs into patients and the community. Health care professionals can do their best to educate and model good health practices, but the final decision to live as healthy as you can is up to each individual.

Another implication that can be applied for better management of these disorders and other chronic diseases is parents promoting independence before the transition to college occurs. If a greater amount of responsibility was expected before the transition, students may experience a smoother conversion. Many students had not yet completely made the transition to full accountability for the different aspects of managing a chronic illness. It could be recommended that parents allow their children more independence. The first time their child experienced a difficult situation on their own, the parent could still follow up and support. Parents play an integral role in the lives of their children. Their support and beliefs often have major effects on how their children will make decisions once they begin to find their independence. If parents gave a limited control to their children during the teen years, students may grow into the role with greater success as they take responsibility for their own body.

There are many opportunities for future research that can enhance the knowledge of this research topic. Future research could add more specific questions to assess the subjects' perception of stress while living at home and after the transition to college. Another portion of the interview guide that could be improved is the portion on support system after the transition to college. An alternate question such as, "Who do you go to now if you are having an episode?" may have yielded better results. Another question that could be beneficial to add would be to inquire about alcohol use among the college students. A more diverse population, including males, other races, and other colleges, would also yield results that could be generalized to larger

populations. Different recruiting strategies could be used to obtain such results, possibly using dorm resident assistance and other local colleges. A very interesting topic to explore in future research would be to explore the reasons behind chronic disease management not being a person's top priority. There was an identified gap in previous literature, because no research on hypoglycemia could be found related to this study. Much more could be done with a greater base of research on hypoglycemia to promote preventative care and keep more patients from advancing hypoglycemia into type 2 diabetes mellitus later in life.

Plans to Disseminate

This research was discussed during its process at the Sigma Theta Tau International Honor Society of Nursing Annual Research Conference. After the research was complete, it will be presented to the faculty of the college of nursing at a faculty meeting. The full research will be presented at the next Sigma Theta Tau International Honor Society of Nursing Annual Research Conference or similar venue.

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Appendix A: Instrument

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 sugar 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 your 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?
 - 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?
- 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?

Appendix B: 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. I will keep your interview recording secure and separate from your consent form.

Only my partner and faculty advisor will have access to your interview recording. If this study is published, information that could identify you will not be used. There are no foreseeable risks if you participate in this study. You may skip any questions that make you uncomfortable. There are no benefits if you participate. However, if you participate, it will help me with my research.

You may contact me or my associate 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.

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

Appendix C: IRB Approval

Deena Zahran
Elizabeth Hale
Dr. Adams
Rebecca Davis

February 8, 2013

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
College of Nursing, University of Alabama in Huntsville,
207 Nursing Building, Huntsville, AL 35899
Phone: 256.824.6742 and fax: 256.824.2850

Table 1: Demographics of Sample Population

	Age	Sex	Current Year in College	Year of Admission	Diagnosis	Race
Subject 1	18	Female	Freshman	2012	Hypoglycemia	Caucasian
Subject 2	18	Female	Freshman	2012	Type 1 Diabetes	Caucasian
Subject 3	20	Female	Junior	2010	Type 1 Diabetes	Caucasian
Subject 4	24	Female	Junior	2012	Hypoglycemia	Caucasian
Subject 5	47	Female	Senior	2010	Hypoglycemia	Caucasian