Will Bi-Monthly Telephone Contact Help Motivation and Compliance To Improve Exercise Regimen in Obese Type 2 Diabetes?

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Abstract

Rising obesity rates in the United States is a great concern. Type 2 diabetes is of equal concern especially when an individual is living with both obesity and type 2 diabetes. The Center for Disease Control and Prevention (CDC) reported that 8.3 percent or 25.8 million people in the U.S. are obese and 9.3 percent or 29.1 million have diabetes. This pilot study is aimed to identify if bi-monthly telephone contact will help motivate obese individuals who have type 2 diabetes to be more compliant with an exercise regimen. Physical activity/exercise is a fundamental component of self-management in diabetes care. The purpose of this project is to identify if bi-monthly telephone contact will help motivate obese individuals who have type 2 diabetes to be more compliant with an exercise regimen. The pilot study consisted of bi-monthly (twice monthly) telephone contact with type 2 diabetics who are obese. The sample size of participants included 20 individuals ranging 19 to 78 years of age. The study included two males and 18 females. Telephone based contact with obese type 2 diabetes in order to motivate and assist in compliance of a physical activity/exercise regimen has been shown to be feasible, resourceful, and beneficial. Participants became more physically active inside and outside the home. Reported finger stick blood glucose readings have improved and participants reported feeling better and healthier after walking.

Keywords: obese, type 2 diabetes, exercise regimen, motivation, bi-monthly, telephone contact

Will Bi-Monthly Telephone Contact Help Motivation and Compliance Improve Exercise Regime in Obese Type 2 Diabetes?

Diabetes is a compelling and complex disease with a high morbidity and mortality rate. The cost associated with this disease, financially and physically, is substantial. Diabetes affects 25.8 million people (8.3%) of the population in the United States, and data from the National Health and Nutrition Examination Survey showed that more than one-third (34.9%) of adults were obese (Centers for Disease Control [CDC], 2013). Diabetes in the U.S. continues to rise and parallels the rising rates of obesity over the last decade (Klein et al., 2004). Exercise and weight loss play a key role for individuals who are obese and living with diabetes in order to maintain healthy glycemic control. Bi-monthly telephone contact can offer support and motivation to assist individuals with type 2 diabetes to be compliant with an exercise and weight loss program.

The Problem

Type 2 diabetes is a chronic health condition that has also been called adult-onset or non-insulin dependent diabetes. Although an individual living with type 2 diabetes is most likely a life-long condition, it can be controlled by losing weight, adhering to a healthy diet and exercise regimen. According to the Foley (2014), coordinator at Endocrinology Consultants, many diabetic patients are obese and participate in no or very little physical activity. Studies have shown that participating in physical activity at least 20 to 30 minutes at 48 hours can play a role in the control of a diabetic individual's hemoglobin A1C by increasing the efficiency of insulin in the body which allows more insulin to enter the cells and decrease blood glucose levels.

Evidence of the Problem

National and International

Regular physical activity can greatly benefit the lives of those with diabetes by assisting in the reduction of chronic health conditions. According to the CDC (2012a) about one in three adults with diabetes had initiated a physical activity program on the advice of their provider of care. According to the CDC (2012b), adults with diabetes were more likely to exercise after being advised than those with hypertension, cardiovascular disease, or cancer.

In 2013, approximately 382 million people worldwide were living with diabetes (International Diabetes Federation, 2013). According to the American Diabetes Association [ADA] (2014), 29.1 million Americans, or 9.3% of the population, have diabetes. Overall, 90% to 95% account for type 2 diabetes diagnoses and type 1 diabetes makes up the remainder (Healthline, 2012).

Regional and Local

According to the Mississippi State Department of Health [MSDH] (2010a), Mississippi ranked first in the nation for overall diabetes prevalence, with over 270,000 adult Mississippians who are living with type 2 diabetes. Specifically speaking, this means that over 12% of the adult population in Mississippi has a diagnosis of type 2 diabetes. The MSDH (2010b) also reported that in 926 Mississippians died due their diabetes in the year 2010, and a great many more are living with the complications caused by type 2 diabetes, including lower extremity amputations, end-stage renal disease, heart disease, and loss of protective sensation. Boseley (2014) reported that a physician at the University of Mississippi Medical Center in Jackson believes that by the year 2030 approximately one third of the Mississippi population will have diabetes. Additionally,

in 2013 the adult obesity rate for Mississippi was at 35.1% (Trust for America's Health and Robert Wood Johnson Foundation, 2014).

Significance of the Project

Being physically active is an indispensable part of self-management in diabetes in conjunction with proper nutrition, meal planning, stress management, and medication regimen. According to the ADA (2014) being physically active:

- Assists insulin use by the body to control blood glucose
- Burns extra body fat
- Boost and builds muscle strength and strengthens bones
- Decreases blood pressure
- Aids in better sleep patterns
- Diminishes stress
- Promotes improved blood circulation
- Gives the body energy
- Deceases LDL ("bad") and increases HDL ('good") cholesterol
- Burns calories to assist in weight loss or weight maintenance

Physical activity and exercise is beneficial for everyone, but it is critically important if you have type 2 diabetes. Exercise is one of the leading activities that individuals, who are obese and have type 2 diabetes, can do for their weight and blood glucose levels.

Impact on Patient Care

The prevalence of type 2 diabetes nationally is growing at a drastic rate requiring new and innovative patient care strategies. These strategies must be well-planned, of exceptional quality, patient-centered, and affordable. Inzucchi et al., (2012) defines patient-centered care as

care that is respectful of and responsive to individual patient preferences, needs, and values and ensures that patient values guide all clinical decisions. The patient should and must be an active participant in the strategies that pertain to their healthcare. The final decision of whether the patient follows the plan of care is primarily in the hands of the patient. The patient should agree to follow dietary changes and take medications as prescribed as well as develop lifestyle modifications such as exercise regimes. Patient education in type 2 diabetes is a critical strategy to ensure more healthful and beneficial outcomes. Health care providers should help motivate patients to adhere and be more compliant with treatments and regimes. Having someone to support and hold them accountable is a valuable tool in the health care plan and can be the tipping point that helps patients stay more focused and on track in the fight for better health.

Impact on Nursing Practice

In a 2006 consensus statement the American Diabetes Association (ADA) reported that two randomized trials each concluded that lifestyle interventions including participating in 150 minutes per week of physical activity and diet-induced weight loss of 5 – 7% reduced the risk of progression from impaired glucose tolerance (IGT) to type 2 diabetes by 58% (Sigal, Kenny, Wasserman, Castaneda-Sceppa, & White, 2006). Additionally, Colberg et al., (2010) reported that individuals with type 2 diabetes should participate in at least 150 minutes per week of moderate to vigorous aerobic exercise spread out over at least 3 days during the week, with no more than 2 consecutive days between sessions.

Advanced practice nurses have been on the front lines in the care and education of individuals with diabetes for many years. The nursing practice setting and involvement has evolved to include many avenues outside the traditional bedside education in hospitals. Advanced practice nurses are competently trained to proficiently educate and provide the care

that type 2 diabetics must have. Exercise has been a key ingredient in the treatment regime for diabetes and will continue to be taught to those living with diabetes in an effort to more effectively manage this chronic and costly illness.

Impact on Nursing Education

Education, especially in the nursing profession, has always been the anchor that holds the practice to its highest standards. Nursing education is a life-long journey that is continually changing and evolving to better serve healthcare consumers. Loveman, Frampton, and Clegg (2008) reported that a major feature of diabetes care and education is empowering the patient to take charge of the disease because of the chronic nature of diabetes and the relation between blood glucose and factors such as diet and exercise (i.e. lifestyle). The CDC (2012) reported in their Diabetes Report Card that type 2 diabetes accounts for about 95% of diagnosed diabetes in adults and that evidence has shown that those with type 2 diabetes who eat healthy and participate in regular physical activity, along with prescribed medication when necessary, are more able to control health complications of the disease.

According to Funnell et al. (2011) diabetes self-management education (DSME) is a critical element of care for all people with diabetes and is necessary in order to improve patient outcomes. The National Standards for DSME are designed to define quality diabetes self-management education and to assist diabetes educators in a variety of settings to provide evidence-based education. Educators, whether hospital-based or in university settings, should use strict evidence-based curriculum when developing educational material for student courses. Accurate, evidence-based curriculum will ensure that students are being taught the priority of caring for patients with diabetes and assisting them to be compliant in their diabetes management. This project reflects the evidence-based data that will be used to assist obese type 2

diabetics to become motivated and be compliant in an exercise regimen that will enhance their health.

Impact on Nursing Research

Nursing research is a pivotal concept in higher education, especially in the nursing profession. Health care recommendations and treatments all involve extensive research for best practice guidelines in patient care, education, and research. Exercise science is congruent throughout the evidence with many nursing research studies. There is an endless amount of studies, articles, and commentaries on the internet regarding the benefits of physical activity and exercise on type 2 diabetes. Multiple databases are readily available and contain a wealth of health information that can lead to better outcomes through exercise.

Colberg et al., (2010) reported that physical exercise causes increased glucose uptake into active muscles balanced by hepatic glucose production, with a greater reliance on carbohydrate to fuel muscular activity as intensity increases. Individuals who have type 2 diabetes and are obese can benefit from the research data results that show how physical activity has significant health benefits. One of the most consistent predictors of greater levels of activity has been higher levels of self-efficacy, which reflect confidence in the ability to exercise. Social support has also been associated with greater levels of physical activity (Colberg et al., 2010). Further research is needed to expand proficiency and knowledge regarding tasks that motivate individuals who are obese and diabetic to be compliant in an exercise regimen.

Purpose of the Project

The purpose of this project is to identify if bi-monthly telephone contact will help motivate obese individuals who have type 2 diabetes to be more compliant with an exercise regimen. Type 2 diabetes is a chronic health condition that has also been called adult-onset or

non-insulin dependent diabetes. Diabetes is usually a life-long condition but it can be controlled by following approved medical guidelines such as medications, proper dietary habits, weight loss, and an exercise regimen. Research has shown that physical activity is a key factor in the prevention and management of type 2 diabetes, but many who have the disease remain relatively inactive. Recent studies now show that type 2 diabetics who participate in regular physical activity have improved glucose control and can even prevent or delay type 2 diabetes. Physical activity also can favorably impact lipids, blood pressure, cardiovascular events, mortality, and quality of life (Colberg et al., (2010).

Definition of Terms

Bi-Monthly: Occurring twice a month.

Exercise Regimen: Physical activity that is done in order to become stronger and healthier.

Hemoglobin A1C: A lab test that reflects the average blood glucose level for the preceding two to three months.

Obesity: Obesity is when an individual's body mass index (BMI) is 30 or higher.

Physical Activity: Any bodily movement produced by skeletal muscles that results in energy expenditure.

Type 2 Diabetes: Diabetes is a problem with your body that causes blood glucose (sugar) levels to rise higher than normal and is also known as hyperglycemia. Type 2 diabetes is the most common form of diabetes when your body does not use insulin properly. This is also called insulin resistance.

Framework

Pender's Health Promotion Model is the framework used for this project. This model has a focus on nursing and behavioral science factors that influence behaviors and is to be used to

guide individuals to explore biopsychosocial processes that motivate them to engage in behaviors directed toward health enhancement (McEwen & Wills, 2011).

The *Pender's Health Promotion Model* consists of three major concepts: 1) individual characteristics and experiences (prior related behavior and personal factors), 2) behavior-specific cognitions and affect (perceived benefits of action, perceived barriers of action, perceived self-efficacy, activity-related affect, interpersonal influences, and situational influences), and 3) behavior outcomes (commitment to a plan of action, immediate competing demands and preferences, and health-promoting behavior) (McEwen & Wills, 2011). This model was chosen because it can be used as a guide to implementing a behavior promotion to help motivate and improve compliance in implementing and maintaining an exercise regimen.

Framework: Review of Literature

McEwen and Wills (2011) reported that *Pender's Health Promotion Model* has been used by numerous nursing scholars and researchers, and is very useful in explaining and predicting specific health behaviors. In addition, nurses can develop and execute health promoting interventions to individuals, groups, and families in schools, nursing centers, occupational health settings, and the community at large. This model reflects the concepts and supporting theories that will be used to guide the capstone project.

Pender (2011) reported key concepts in nursing that defined a basis of the health promotion model.

- Person: a biopsychosocial organism that is partially shaped by the environment but also seeks to create an environment in which inherent and acquired human potential can be fully expressed. Thus, the relationship between person and environment is

reciprocal. Individual characteristics as well as life experiences shape behaviors including health behaviors.

- Environment: is the social, cultural and physical content in which the life course unfolds. The environment can be manipulated by the individual to create a positive context of cues and facilitators for health-enhancing behaviors.
- Nursing: is collaboration with individuals, families, and communities to create the most favorable conditions for the expression of optimal health and high-level well-being.
- Health: in reference to the individual is defined as the actualization of inherent and acquired human potential through goal-directed behavior, competent self-care, and satisfying relationships with others, while adjustments are made as needed to maintain structural integrity and harmony with relevant environments. Health is an evolving life experience. There are definitions for family health and community health that have been proposed by other authors.
- Illness: discrete events throughout the life span of either short (acute) or long (chronic) duration that can hinder or facilitate one's continuing quest for health.

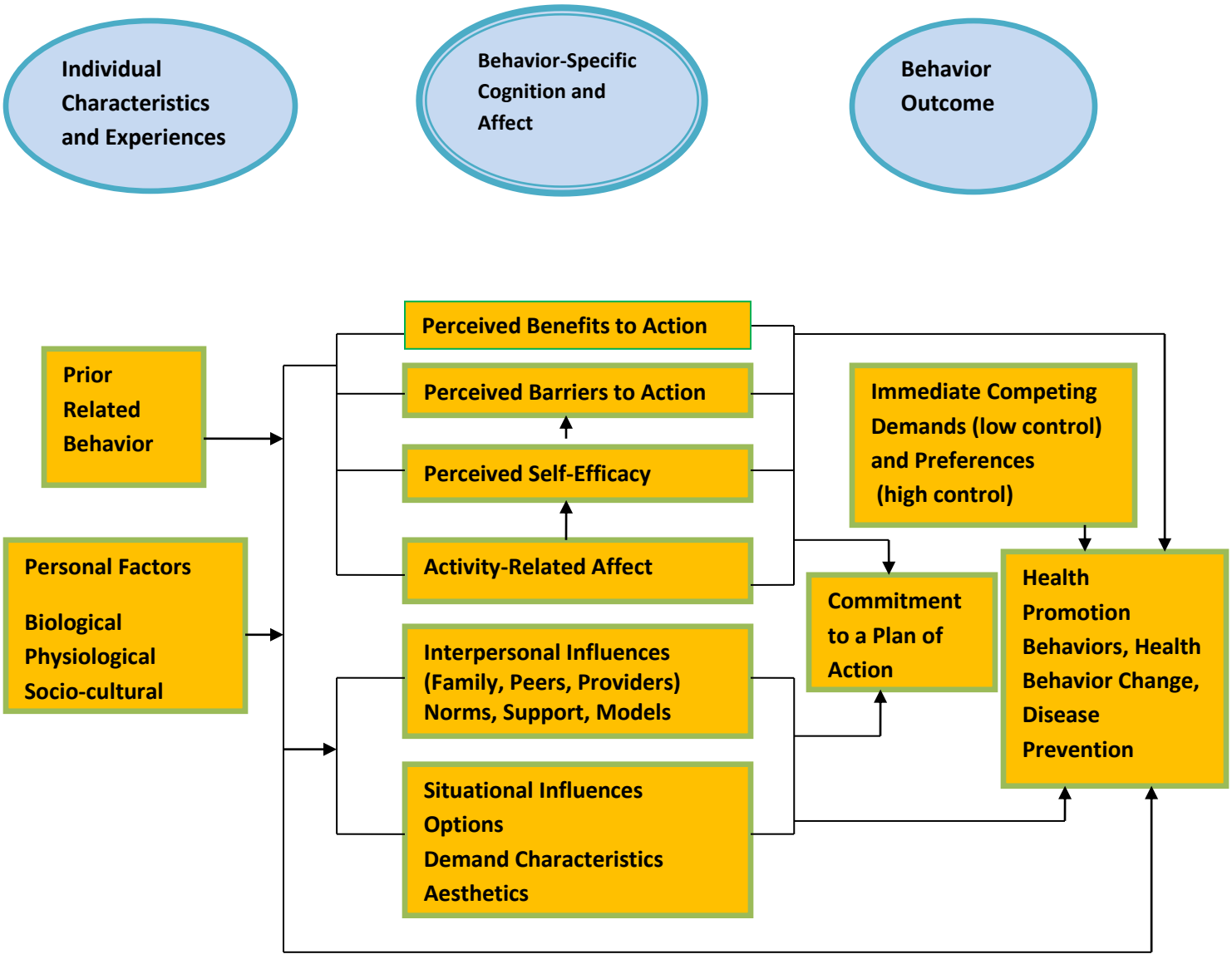


Figure 1: Health Promotion Model. M. McEwen and E. M. Wills, 2011, Theoretical Basis for Nursing, 3, p. 226. Copyright 2006 by Health promotion in nursing practice.

Pender's Health Promotion Model (HPM) was originally devised in 1982 and then revised in 1996. The HPM is an interpretive model of health behaviors that emphasizes the role of expectations in the shaping of behavior (Ho, Berggren, & Dahlborg-Lyckhage, 2010). The greater an individual's self-efficacy or perceived competence for a behavior, the more likely the individual will commit to action and actually carry out this behavior. The HPM grants nurses to

examine “the complex biopsychosocial processes that motivate individuals to engage in behaviors directed toward the enhancement of health” (Ho, Berggren, & Dahlborg-Lyckhage, 2010).

Assumptions

The following assumptions were made and will be instrumental in this study:

1. Health care staff and providers will be supportive of the plan for this study.
2. Participants of this study will take ownership in seeking to actively coordinate and control their own behavior.
3. An environment of trust, confidence, privacy, support, and comfort will be maintained in this study.
4. Participants will interact with the facilitator in this study on a interpersonal level and see a healthy lifestyle change.

Review of Literature

There is not a large volume of literature specifically focused on how telephone contact helps motivate type 2 diabetic individuals to comply with an exercise regimen. The majority of literature focuses specifically on diabetes and exercise and does not include the terms telephone contact intervention. A conclusive review of literature was conducted utilizing the Cumulative Index to Nursing and Allied Health Literature (CINAHL), the United States National Library of Medicine (MEDLINE), the Education Resources Information Center (ERIC), and the Cochrane Library databases.

The CINAHL database was searched with the following key words, revisions and results:

- Telephone contact for exercise regimen, 428 hits, relevant = 6
- Exercise regimen and type 2 diabetes, 11 hits, relevant = 2

- Telephone contact and diabetes motivation, 826 hits (SmartText), relevant = 4
- Diabetes, obesity, exercise, 2,931 hits, relevant = 8
- Telephone motivation for exercise in diabetes, 11,680 hits, relevant = 5

The majority of the relevant articles were found during the review of the CINAHL database that focused on telephone contact and exercise regimen. The hits were numerous but were not relevant to the topic of this project.

The next search was MEDLINE database. Keywords used were:

- Telephone contact for exercise regimen, 3 hits, relevant = 1.
- Exercise regimen and type 2 diabetes, 198 hits, relevant = 11.
- Telephone contact and diabetes motivation, 6 hits, relevant = 0.
- Diabetes, obesity, exercise, 4444 hits, relevant = 21.
- Telephone motivation for exercise in diabetes, 15 hits, relevant = 3.

The ERIC database was more grounded in education topics and the following terms were used during the search:

- Telephone contact for exercise regimen, 3 hits, relevant = 0.
- Exercise regimen and type 2 diabetes, 6 hits, relevant = 0.
- Telephone contact and diabetes motivation, 12 hits, relevant = 0.
- Diabetes, obesity, exercise, 58 hits, relevant = 3.
- Telephone motivation for exercise in diabetes, 22 hits, relevant = 1.

The following terms was used during a search of the Cochrane database:

- Telephone contact for exercise regimen, 0 hits, relevant = 0.
- Exercise regimen and type 2 diabetes, 3 hits, relevant = 0.
- Telephone contact and diabetes motivation, 0 hits, relevant = 0.

- Diabetes, obesity, exercise, 10 hits, relevant = 2.
- Telephone motivation for exercise in diabetes, 3 hits, relevant = 2.

Telephone Contact

Zolfaghari, Mousavifar, Pedram, and Haghani (2012) conducted a study that compared the effectiveness of short message service and telephone follow-up methods in patients with type 2 diabetes. The authors found that participation by the patient in their care and continuous follow-up methods appear to be more effective regarding compliance. The authors also reported that the use of mobile phones is an essential and widely used in everyday life; therefore, telephone contact is a convenient method of follow-up. Short message service (SMS) is another interactive method that is simple, fast, confidential, and cost-effective for the provider of care and the patient (Zolfaghari, Mousavifar, Pedram, & Haghani, 2012). The authors discovered that SMS and nurse-led telephone follow-up did improve adherence to diabetes therapeutic regimens and hemoglobin A1C (HbA1c).

Nesari, Zakerimoghadam, Rajab, Bassampour, and Faghihzadeh (2010) studied whether telephone follow-up by a nurse could improve the adherence level of diabetes care regimens in type 2 diabetics. This study focused on the patient and their control of near-normal blood glucose levels as a result of self-management through healthy diets, regular exercise, and taking proper medications. The study concluded that the telephone follow-up by a nurse was efficient in boosting the adherence level in type 2 diabetes.

A pilot study was conducted by Lewis, Martinson, Sherwood, and Avery (2011) to determine if a telephone-based exercise intervention was beneficial during pregnancy. The authors reported that exercise during pregnancy can reduce rates of gestational diabetes, anxiety,

insomnia, and excessive weight gain. The results of this study concluded that pregnant women who participated greatly increased their levels of exercise regimen.

Enhancing Diabetes Knowledge and Motivation

An individual can be extremely health conscious in one aspect and not in others. It is important that people living with diabetes and are obese have optimal strategies to control and maintain a healthy lifestyle to promote positive health outcomes.

Long and Gambling (2012) studied how changes in the extent of knowledge of diabetes along with confidence and motivation strengthened behavioral change interventions for patients with type 2 diabetes. This study used concentrated telephone education that was specifically customized to the individuals' health circumstance. The educational process had two levels: (1) health literacy, knowledge reinforcement, and personal management skills; and (2) self-control, socio-psychological behavioral change, and enabling increased motivation and supportive problem-solving. Over 90% of individuals who participated in the study indicated their confidence in maintaining control of their diabetes. An observation of enhanced competence in translating knowledge into a lifestyle was seen (Long & Gambling, 2012).

Plotnikoff et al. (2010) conducted a study that focused on peer-led counseling for type 2 diabetics and physical activity in relation to cognition and changes in behavior. The counseling consisted of weekly telephone contact for a period of 12-weeks. Study participants reported that their decision to remain involved in physical activity was due in part from the peer counseling motivation.

The technological explosion has greatly benefited people all over the world. The use of mobile devices and social media help to keep individuals in constant contact. A study by Hurling et al. (2007) was conducted in an effort to assess how the internet and mobile phone technology

influenced a physical activity program. Participants received a schedule to plan weekly exercise sessions with mobile phone and email reminders, along with an access to a message board to post their experiences and personal feedback regarding their physical activity. This study concluded that internet and mobile phone-based motivation and active support system increased and assisted participants in maintaining a higher level of physical activity.

Peer Support

A realistic understanding, along with a support system, is a priority in managing dibetes. Peer support may improve self-management among countless individuals (Fisher, Earp, Maman, & Zolotor, (2010). Heisler (2009) reported that peer support is assistance from a person who has experiential knowledge of a specific behavior or stressor and similar characteristics as the target population. The health care needs of diabetic individuals are largely met in the clinic setting during face-to-face contact. However, individuals with diabetes still must achieve many self-management skills such as taking their medications, proper diet habits, self-monitoring their glucose, and adhering to an exercise regimen. Peer support for these self-management skills can have a significant positive impact to the health of individuals with diabetes (Fisher, Earp, Maman, & Zolotor, 2010)

Telephone contact as a peer support mechanism can offer an effective and cost efficient continuum of diabetic services. Telephone-based counseling allows for frequent patient contacts is a low cost tool to improve diabetes self-care and health outcomes. Telephone-based peer-support interventions can be a satisfactory substitute for face-to-face interactions (Heisler, 2009).

Narrative Review of Literature

The Keywords, telephone contact, exercise, type 2 diabetes, motivation, and obesity were used for this review of literature. However, a smaller body of evidence was related specifically to telephone contact to assist with motivation and compliance to an exercise regimen in patients with type 2 diabetes. Two avenues that have been found to be very effective in increasing patient compliance is the use of mobile phones and short message service. Both of these avenues utilize every day technology and are also a simple, interactive, fast, confidential, and cost-effective for both the provider and the patient. Both the mobile phone and SMS approaches by a nurse-led follow-up session has shown to improve diabetes therapeutic regimens and HbA1c (Zolfaghari, Mousavifar, Pedram, & Haghani (2012).

Telephone contact by nurses that focused on the patient controlling blood glucose levels through effective self-management by healthy diets, exercising regularly, and taking prescribed medications as ordered has also been shown to improve adherence to type 2 diabetes management (Nesari, Zakerimoghadam, Rajab, Bassampour, & Faghihzadeh, 2010). Lewis, Martinson, Sherwood, and Avery (2011) conducted a pilot study that produced evidence that demonstrated the effectiveness of telephone-based exercise regimens during pregnancy. Pregnant women who exercised had a reduction in the rate of gestational diabetes, anxiety, insomnia, and excessive weight gain.

Individuals with type 2 diabetes who are counseled through peer-led telephone contact regarding their physical activity have also been shown to have increased health benefits. These individuals also agreed that the peer counseling served as a good motivator for their activity (Plotnikoff et al., 2010).

The overall significant finding from the literature review for this project is that a telephone contact and telephone-based care intervention does have a compelling positive impact to the health of those living with type 2 diabetes. Individuals living with type 2 diabetes often benefit from the support of a peer who is experienced and knowledgeable in the journey to optimize their health. Telephone contact interventions are a valid substitute for face-to-face clinic visits (Heisler, 2009).

Planned Translation/Application Project

Setting

Endocrinology Consultants is located in Tupelo, Mississippi near North Mississippi Medical Center (NMMC), which is the largest rural hospital in America and serves 24 counties in North Mississippi and Northwest Alabama. The physical size of Endocrinology Consultants is 15,000 square feet and serves approximately 14,000 patients each year. The clinic sees a variety of diagnoses which include individuals who need care for their diabetes, and other endocrine disorders.

Endocrinology Consultants clinic is actually divided into two (east and west) identical clinics. The east and west clinics are staffed with two endocrinologists and two nurse practitioners. Additional staff includes:

- Six registered nurses
- Two medical assistants
- Two lab technicians
- One registered dietician
- Two certified diabetes educators
- One registered nurse (audits blood glucoses only)

- Several front desk and other office personnel

The purpose of Endocrinology Consultants is to provide quality health care to the community that it serves and to continuously strive to provide state of the art, comprehensive, and assessable endocrinology and metabolism services to the region and those individuals served (Foley, personal communication, June 1, 2014).

Population and Sampling Procedures

The study procedures will consist of bi-monthly telephone contact with type 2 diabetics who are obese. The student investigator will serve only as a coach, encourager, and motivator to each participant and no medical orders will be given by the investigator to the participant. The telephone calls will be conducted from Endocrinology Consultants clinic so that the clinic phone number and name will appear on the participants' caller ID. Participants in the study will be selected by Lisa Foley, Family Nurse Practitioner (FNP), and the coordinator of Endocrinology Consultants according to diagnosis, weight, and health status. A sample size of than approximately 15 to 20 patients will be used since the study will consist of phone calls to each participant twice per month. The responsible student for this project will serve as the investigator of this project and provide the telephone counseling. The investigator will only be serving as a motivator and communicator to participants. There will be no face-to-face contact and no physical or emotional risk involved. There is no expected cost or compensation to participate in this study. Participant privacy will be adhered to as stated in the Samford University Institutional Review Board (IRB), informed consent for participation in a research study.

Detailed Plan for Project/Intervention

The initial task for this project is the selection of the participants and the informed consent to participate in the project. Each participant will be given a brief five question pre-

participation questionnaire to complete. Lisa Foley, FNP and Coordinator for Endocrinology Consultants, will provide the student investigator with each participants' contact information and a brief overview of each participant. Participants will be informed that they will receive two telephone contact calls each month from the investigator.

The first telephone contact will involve a conversation regarding goal-setting, potential barriers, and problem-solving related to an exercise regimen. Contact telephone calls thereafter will focus on the participant's goals and the motivation to achieve those goals. A face-to-face debriefing session after each bi-monthly contact will be held with the coordinator of the clinic so that needed feedback and advisement can be achieved. The investigator will only be acting as a motivator so that the participant can receive as much assistance as possible.

Upon completion of this project, all participants will be asked to complete a three question post-participant questionnaire. This questionnaire will be used to gather the needed information for this projects' conclusion and results. All participants who participate in the full project will be entered in a drawing for a Wal-Mart gift card that will be mailed to them from Endocrinology Consultants along with a personal thank you letter from the investigator.

Resource Requirements and Source

Resources required for this project will include an informed consent for participation in a research study and a pre-participation and post-participation questionnaire. The only technological resource required in this project is a clinic land-line telephone. All telephone calls will be made from the Endocrinology Consultants clinic so that the participant will see the clinic name appear on their caller ID. This will enable the participant to feel safer about answering the phone call and also to prevent this author's mobile phone number being shared with participants.

Budget

There is no cost for the participant or the clinic. A budgeted amount for the researcher is a $25 gift card from Wal-Mart.

Proposed Timeline

Project components are in process and should be finalized in January 2015. The actual implementation of this project will be approximately eight weeks in length. The proposed start date is February 1, 2015 through April 1, 2015.

Plan for Evaluation

The plan for evaluation of data from this study will be done by a post-participation research study questionnaire and during the final phone contact. During this final phone contact the participant will be allowed to share verbal comments of the pros and cons of this study. The post-participation questionnaires will be mailed and/or electronically mailed to the participant by Endocrinology Consultants. Results of this study will be reviewed with the dietician and coordinator of Endocrinology Consultants. The evaluation of the effectiveness of this study will be documented and shared through a final report.

Project Implementation

The pilot study consisted of bi-monthly (twice monthly) telephone contact with type 2 diabetics who are obese. The sample size of participants included 20 individuals ranging 19 to 78 years of age. The study included two males and 18 females. The initial telephone contact included an introduction from the student investigator, a brief overview of the study, and a pre-participation questionnaire. In addition, the initial telephone contact included goal-setting, potential barriers, and problem-solving related to an exercise regimen. A verbal commitment to strive to participate in physical activity/exercise every two days for at least twenty minutes was

obtained with the initial phone conversation. The student investigator consisted of being a motivator and communicator in order that the participant received the optimal benefits.

The student investigator and the Clinic Coordinator/Family Nurse Practitioner (FNP) chose the potential participants for the study. Informed consent to participate in the study was gained by Clinic Coordinator/FNP of Endocrinology Consultants in Tupelo, Mississippi. This endocrinology clinic serves approximately 14, 000 patients each year in 24 counties in North Mississippi and Northwest Alabama. Endocrinology Consultants cares for a variety of diagnoses including diabetes and other endocrine disorders.

Each study participant received a telephone call every other week for a two months beginning on February 01, 2015 through April 01, 2015. After the initial contact, the remaining telephone contact sessions focused on the consistency of each participant's physical activity/exercise regimen involvement. Conversations included topics such as walking outdoors, exercises in the home, exercise safety issues, dietary, and motivation issues. The final telephone contact included a post-participant questionnaire, present physical activity/exercise level, blood glucose status readings, and if the study has been beneficial.

Results

Twenty studies were reviewed to determine the outcomes of bi-monthly telephone contact on motivation, compliance, and exercise regimen in obese type 2 diabetes. Of the twenty participants, nineteen reported that their finger-stick blood sugar readings ranged from stable to excellent with the majority reporting better blood sugar readings. A majority of the participants reported that their physical activity/exercise has increased from sedentary to light and one participant reported an increase from sedentary to moderate physical activity/exercise regimen. When asked to what extent the participation in the pilot study benefited their lifestyle, an

overwhelming number reported an extensive positive difference. In evidence of participant reports on the Post-Participation Questionnaire the purpose of the pilot study has been achieved. Comments from a Post-Participation Questionnaire include:

- Helped me to understand how exercise can improve my health. The encouragement was wonderful and I enjoyed the conversation.
- Diet is much better and my triglycerides have improved. I am walking the track more often now. A1C is 5.8
- Walking on the track more often. I have had lower blood sugar readings.
- Walking more and sometimes using hand weights during exercising.
- Trying to walk more often when the weather permits. I do feel better when I walk more.
- I walk outside a few days a week when the weather is nice for about 15 to 30 minutes. My A1C is down to 6.0 now.
- I have started going to Walmart just to push a shopping cart and walk. I feel safer walking this way. Weather has been really bad lately.
- This study has been more of an inspiration than anything.
- Walk a lot at Sonic where I work.
- Love to walk my dog more now when the weather permits.
- Got me to be more involved in exercise and thinking about my health and exercise.

Discussion

The purpose of the present study was to identify if bi-monthly telephone contact will help motivate obese individuals who have type 2 diabetes to be more compliant with a physical activity/exercise regimen. This pilot study has shown that it is feasible and resourceful to utilize a telephone contact intervention to motivate and improve exercise regimen compliance. The strengths of the study were the telephone contact between the student researcher and the study participants; the motivation received by the participants; and the actual compliance in a physical activity/exercise regimen by participants. The greatest challenge and difficulty in the study was the weather conditions. The time frame of the study occurred during a time when the weather fluctuated between extreme coldness with some instances of heavy snow storms and a period of significant heavy rain fall. A majority of the study participants are older adults who have safety concerns and physical ailments that can be unsafe and difficult for them to attempt walking in such extreme weather conditions.

One of the greatest strengths of the project was that the participants were still willing to adhere to an exercise regimen in their homes. Those with some physical ailments participated in chair exercises, walking indoors, using hand weights, and being more physically active indoors than usual. Participants were so happy to be involved in the study and so appreciative of the telephone contact and motivation that they got creative with their exercise regimen even during uncooperative weather conditions.

Findings from this pilot study were relevant in comparison to the literature. Participants reported that they feel better and healthier from taking part in this study. Many are walking more and being more physical active and also consuming a better diet. Participants reported that their

finger stick blood glucose readings have been better and that their A1C has decreased. One participant commented that “the study has been more of an inspiration than anything.”

Limitations

Possible sources of bias in this pilot study may be that all of the participants did not have a follow-up A1C because their regular scheduled endocrinology appointment wasn’t at the conclusion of the study. Participants were monitored by telephone contact and verbal reports which could be a limitation for this study. Additionally, the sample size was small and primarily female.

Applications

Future studies related to telephone contact for motivation in obese type 2 diabetics can possibly benefit in an initial face-to-face contact so that a deeper understanding of the study and expectations can be provided. While this initial contact may be difficult it is believed to be an advantage to the researcher and participant. Providing the participants with an education pamphlet related to the study can also be of great benefit. It is also reasonable to accept that any future study would produce significantly greater outcomes if the intervention period were during the spring or summer months.

Summary

Telephone based contact with obese type 2 diabetes in order to motivate and assist in compliance of a physical activity/exercise regimen has been shown to be feasible, resourceful, and beneficial. Participants became more physically active inside and outside the home. Reported finger stick blood glucose readings have improved and participants reported feeling better and healthier after walking.

The use of technological tools, devices, and programs for health benefits has grown tremendously and will continue to expand in the future. It is imperative to continue utilizing technology to change and improve the overall health status of individuals. Taking charge of one's health can take motivation from many resources but can lead to an empowering and effective journey toward a healthier future.

Dissemination Plans

This Capstone Project will be presented in a poster presentation at Samford University on May 13, 2015 as a requirement for graduation from the Doctor of Nursing Practice program on May 15, 2015. Future plans for this project is to present a poster presentation at the North Mississippi Medical Center's (NMMC) annual three-day outcomes conference August 27 – 29, 2015. There could be other opportunities to present the project in a lecture and round table environment at Mississippi University for Women and other higher learning institutions.

References

American Association of Colleges of Nursing. (2006). AACN position statement on nursing research. Retrieved from http://www.aacn.nche.edu/publiciations/position/nursing-research

American Diabetes Association. (2014). Standards of medical care in diabetes---2014. *Diabetes Care,* 37, S14-S80.

American Diabetes Association. (2014). Statistics about diabetes. Retrieved from http://www.diabetes.org/diabetes-basics/statisitics

Boseley, S. (2014). One-third of Mississippi population will have diabetes by 2030, doctor warns. Retrieved from http://www.theguardian.com/world/2014/jan/14/mississippi-population-diabetes-2030-obesity

Centers for Disease Control. (2012a). Diabetes report card 2012. Retrieved from http://www.cdc.gov/diabetes/pubs/pdf/diabetesreportcard.pdf

Centers for Disease Control. (2012b). Trends in adult receiving a recommendation for exercise or other physical activity from a physician or other health professional. Retrieved from http://www.cdc.gov/nchs/data/databriefs/db86.pdf

Centers for Disease Control. (2013). Adult obesity facts. Retrieved from http://www.cdc.gov/diabetes/pubs/statereport14.htm

Colberg, S. R., Sigal, R. J., Fernhall, B., Regensteiner, J. G., Blissmer, B. J., Rubin, R. R., ... & Braun, B. (2010). Exercise and type 2 diabetes: The American college of sports medicine and the American diabetes association: Joint position statement executive summary. *Diabetes Care*, 33, 2692-2696.

Fisher, E. B., Earp, J. A., Maman, S., & Zolotor, A. (2010). Cross-cultural and international adaptation of peer support for diabetes management. *Family Practice*, 27, 6-16.

Foley, L. (personal communication, June 1, 2014)

Funnell, M. M., Brown, T. L., Childs, B. P., Haas, L. B. Hosey, G. M., Jensen, B., ... & Weiss, M. A. (2011). National standards for diabetes self-management education. *Diabetes Care*, 34, S89-S96.

Healthline. (2012). Type 2 diabetes statistics and facts. Retrieved from http://www.healthline.com/health/type-2-diabetes/statistics

Heisler, M. (2009). Different models to mobilize peer support to improve diabetes self-management and clinical outcomes: evidence, logistics, evaluation considerations and needs for future research. *Family Practice*, 3.

Ho, A. Y. K., Berggren, I., & Dahlborg-Lyckhage, E. (2010). Diabetes empowerment related to Pender's Health Promotion Model: A meta-synthesis. *Nursing & Health Sciences*, 12, 259-267.

Hurling, R., Catt, M., De Boni, M., Fairley, B. W., Hurst, T., Murry, P., ... & Sodhi, J. S. (2007). Using internet and mobile phone technology to deliver an automated physical activity program: randomized control trial. *Journal of Medical Internet Research*, 9.

International Diabetes Federation. (2013). Diabetes: facts and figures. Retrieved from http://www.idf.org/worlddiabetesday/toolkit/gp/facts-figures

Inzucchi, S. E., Bergenstal, R. M., Buse, J. B., Diamant, M., Ferrannini, E., Nauck, M., Peters, ... & Matthews, D. R. (2012). Management of hyperglycemia in type 2 diabetes: a patient-centered approach position statement of the American Diabetes Association (ADA) and

the European Association for the Study of Diabetes (EASD). *Diabetes Care*, 35, 1364-1379.

Klein, S., Sheard, N. F., Pi-Sunyer, X., Daly, A., Wylie-Rosett, J., Kulkarni, K., & Clark, N. G. (2004). Weight management through lifestyle modification for the prevention of type 2 diabetes: Rationale and strategies of the American diabetes association, the north American association for the study of obesity, and the American society for clinical nutrition. *Diabetes Care*, 27, 2067-2073.

Lewis, B. A., Martinson, B. C., Sherwood, N. E., & Avery, M. D. (2011). A pilot study evaluating a telephone-based exercise intervention for pregnant and postpartum women. *Journal of Midwifery & Women's Health*, 56, 127-131. doi: 10.1111/j.1542-2011.2010.00014.x

Long, A., & Gambling, T. (2012). Enhancing health literacy and behavioural change within a tele-care education and support intervention for people with type 2 diabetes. *Health Expectations: An International Journal of Public Participation in Health Care and Health Policy*, 15, 267-282. doi: 10.1111/j.1369-7625.2011.00678.x

Loveman, E., Frampton, G. K., & Clegg, A. J. (2001). The clinical effectiveness of diabetes education models for type 2 diabetes: A systematic review. *Health Technology Assessment,* 12, 1-136.

McEwen, M., & Wills, E. M. (2011).Overview of selected middle range nursing theories. Theoretical basis for nursing (3rd ed., pp.220-247). Philadelphia, PA: Lippincott Williams & Wilkins.

Mississippi State Department of Health. (2010b). Diabetes in Mississippi: Diabetes is serious, controllable and preventable. Retrieved from http://msdh.ms.gov/msdhsite/_static/43,0,296.html

Nesari, M., Zakerimoghadam, M., Rajab, A., Bassampour, S., & Faghihzadeh S. (2010). Effect of telephone follow-up on adherence to a diabetes therapeutic regimen. *Japan Journal of Nursing Science,* 7, 121-128. doi: 10.1111/j.1742-7924.2010.00146.x

Plotnikoff, R. C., Johnson, S. T., Luchak, M., Pollock, C., Holt, N. L., Leahy, A., Liebreich, T., Sigal, R. J., & Boule, N. G. (2010). Peer telephone counseling for adults with type 2 diabetes mellitus: a case-study approach to inform the design, development, and evaluation of programs targeting physical activity. *The Diabetes Educator,* 36, 717-729. doi: 10.1177/0145721710376327

Sigal, R. J., Kenny, G. P., Wasserman, D. H., Castaneda-Sceppa, C., & White, R. D. (2006). Physical activity/exercise and type 2 diabetes: A consensus statement from the American diabetes association. *Diabetes Care*, 29, 1433-1438.

Trust for America's Health and Robert Wood Johnson Foundation. (2014). The state of obesity. Retrieved from http://stateofobestiy.org/states/ms/

Umpierre, D., Ribeiro, P. A., Kramer, C. K., Leitao, C. B., Zucatti, A. T., Azevedo, M. J., ... & Schaan, B. D. (2011). Physical activity advice only or structured exercise training and association with HbA1c levels in type 2 diabetes: a systematic review and meta-analysis. *JAMA*, 305, 1790-1799.

Zisser, H., Gong, P., Kelley, C. M., Seidman, J. S., & Riddell, M. C. (2011). Exercise and diabetes. *International Journal of Clinical Practice*, 65, 71-75.

Zolfaghari, M., Mousavifar, S. A., Pedram, S., & Haghani, H. (2012). The impact of nurse short message services and telephone follow-ups on diabetic adherence: which one is more effective? *Journal of Clinical Nursing*, 21, 1922-1931. doi: 10.1111/j.1365-2702.2011.03951.x

Appendices

Pre-Participation
Research Study Questionnaire
(Complete during initial phone contact)

Date: _____ Name or Initials_____

1. Describe your current physical activity/exercise levels:

Circle your answer

Sedentary
Light
Moderate
Vigorous

Type of Exercise: _____

Frequency (sessions per week): _____

Duration (minutes per week): _____

2. Have you been told that you have any of the following? Circle

High Blood Pressure _____

High Cholesterol _____

High Blood Sugar/ _____

3. Have you spent time in hospital for any medical condition/illness/injury during the last 12 months? YES NO

If yes, what was the reason for hospitalization? _____

4. Do you have any muscle, bone or joint pain or soreness that is made worse by particular types of activity? YES NO

If yes, what joints are involved? _____

COMMENTS:

Post-Participation
Research Study Questionnaire
(Complete during final phone contact)

Date:_____ Name or Initials_____

1. Describe your current physical activity/exercise levels:

Circle your answer

Sedentary
Light
Moderate
Vigorous

Type of Exercise: _____

Frequency (sessions per week): _____

Duration (minutes per week): _____

2. Have you been told that you have any of the following? Circle

High Blood Pressure _____

High Cholesterol _____

High Blood Sugar _____

3. Have you spent time in hospital for any medical condition/illness/injury during the last 12 months? YES NO

If yes, what was the reason for hospitalization? _____

4. Do you have any muscle, bone or joint pain or soreness that is made worse by particular types of activity? YES NO

If yes, what joints are involved? _____

5. To what extent did participating in this study have on your life as a person living with type 2 diabetes?

1	2	3	4	5
No Difference				Extensive Difference

<u>COMMENTS</u>:

Will Bi-Monthly Telephone Contact Help Motivation and Compliance To Improve Exercise Regimen in Obese Type 2 diabetes?

Dr. James Terry Todd, DNP, RN
Mississippi University for Women

PROBLEM

- Type 2 diabetes is a chronic health condition
- Type 2 diabetes can be controlled by:
  - Losing Weight
  - Healthy Diet
  - Exercise/Physical Activity
  - Medication
- 20 to 30 minutes of exercise/physical activity every 48 hours can help in the control of type 2 diabetes

PURPOSE

To identify if bi-monthly telephone contact will help motivate obese individuals who have type 2 diabetes to be more compliant with an exercise regimen.

Research has shown that physical activity is a key factor in the prevention and management of type 2 diabetes, but many who have the disease remain relatively inactive.

Recent studies now show that type 2 diabetics who participate in regular physical activity have improved glucose control and can even prevent or delay type 2 diabetes.

Physical activity also can favorably impact lipids, blood pressure, cardiovascular events, mortality, and quality of life (Colberg et al., (2010).

INTERVENTIONS

- Pilot study consisted of bi-monthly (twice monthly) telephone contact with type 2 diabetics who are obese.
- Sample size = 20 individuals (2 males and 18 females) ranging 19 to 78 years of age.
- Initial telephone contact included an introduction from the investigator, a brief overview of the study, and a pre-participation questionnaire. Additionally, goal-setting, potential barriers, and problem-solving related to an exercise regimen were discussed.
- A verbal commitment to strive to participate in physical activity/exercise every two days for at least twenty minutes was obtained with the initial phone conversation.
- The investigator provided motivation and support to assist the participant in receiving optimal benefits.

OUTCOMES

- Data from 20 participants were reviewed and analyzed.
- A majority reported better blood glucose readings during the study.
- A majority reported an increase from sedentary to light physical activity/exercise.
- One participant reported an increase from sedentary to moderate physical activity/exercise.
- Overwhelming number of participants stated that the study made an extensive positive difference in their lifestyle.

Comments from a Post-Participation Questionnaire include:

→ Helped me to understand how exercise can improve my health. The encouragement was wonderful and I enjoyed the conversation.

→ Diet is much better and my triglycerides have improved. I am walking the track more often now. A1C is 5.8

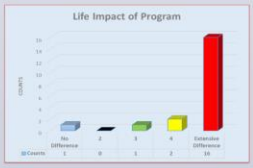
→ Trying to walk more often when the weather permits. I do feel better when I walk more.

→ I walk outside a few days a week when the weather is nice for about 15 to 30 minutes. My A1C is down to 6.0 now.

→ This study has been more of an inspiration than anything.

→ Got me to be more involved in exercise and thinking about my health and physical activity.

1 = no difference
2 = slight difference
3 = moderate difference
4 = great difference
5 = extensive difference



CONCLUSIONS

Based on the reviews of this pilot study the evidence supports that motivation, compliance, and exercise regimens will improve through bi-monthly telephone contact with obese type 2 diabetics.

RECOMMENDATIONS

Intervention Period

- It is reasonable to accept that any future study would produce significantly greater outcomes if the intervention period were during the spring or summer season.

Participant Limitations

- Small sample size and primarily female
- Some participants could not participate effectively due to physical status