

# Sample article review on mn504 quantitative critique

[Business](#), [Management](#)



## **Problem**

What is the problem the study was conducted to research?

Type 2 diabetes mellitus (T2DM) is a global health issue. There is an increase in type 2 diabetes in African-Americans. Lack of knowledge in lifestyle and treatment interventions has led to the increase of T2DM in African-Americans. Type 2 Diabetes is a leading cause of blindness, renal diseases and lower limb amputations. African-Americans having T2DM also suffer from high blood pressure and low glycemic levels in blood.

## **Why is the problem an important one for nursing to research?**

Diabetes has become a serious health issue among the public. Registered nurses should have latest knowledge about different interventions for diabetes. The article is important since it enlightens a nursing professional about the impact of self-management on type 2 diabetics.

## **Study Purpose**

What is the purpose of the study?

The study enlightens us about type 2 diabetes and its impact as a global health issue. The study is used to check the feasibility of diabetes self-management intervention in young and older individuals with type 2 diabetes.

## **Research Question**

What is the main research question?

The main research question is that whether diabetes self-management

education (DSME) improved the overall health of an individual and whether DSME and increased quality of life in type 2 diabetes individuals.

## **Hypothesis/hypotheses**

What is the study hypothesis? If it is not stated, what would you say the hypothesis is?

There was no hypothesis mentioned as such. However it could be hypothesized that Diabetes self-management education (DSME) would be the best treatment intervention compared to all major treatment interventions for type 2 diabetes individuals.

## **Study Variables**

Identify and describe the major study variables. Identify the study variables by examining the purpose, the objectives, questions, or hypotheses, and the results section of the research article.

There were in total 5 variables in the study. Depression, Anxiety, Stress, BMI and glycemic HbA1c levels. Within BMI, height is an independent variable. While the remaining 4 variables are dependent.

## **INDEPENDENT**

Define the meaning of the term “ independent variable.”

An independent variable is a variable that has no significant impact on the outcomes of an experiment. Its role in the experiment is important but its presence would not have a significant impact on the end results. (North Carolina State University)

**Identify the independent variables in this study and provided a definition of the variable.**

In the study, there was only a single variable and that is height. Height of an individual is considered prior to study. However, since height does not change over time and its presence does not impact end results, it is considered to be an independent variable.

**How is the independent variable carried out in this study?**

The independent variable, in this study height. It was only considered during the initial stages of the study. Its role is important since it is used in calculating BMI, which in turn is used to check weight and intervention management. There was no special techniques or procedures in considering the independent variable in this case.

**DEPENDENT**

Define the meaning of the term “ dependent variable.”

A dependent variable is dependent on the independent variable. Changes in this variable would have impacts on the experimental procedures. End results are mainly calculated on the basis of dependent variables. (North Carolina State University)

**Identify the dependent variables in this study and provide a definition of the variable.**

There are 4 dependent variables in the study. Depression, Anxiety, Stress, weight and glycemic HbA1c levels. It is a known fact that all these change in an individual from time to time. Self-management in individuals with type 2 diabetes would change in the above variables drastically.

**How is the dependent variable measured in this study?**

Dependent variables were measured using specific tool-kits. Center for Epidemiological Studies Depression Scale (CES-D) was used to measure depressive symptoms. Spielberger State-Trait Anxiety Inventory (STAI) was used to measure anxiety disorders. Perceived Stress Scale (PSS) was used to measure stress levels in individuals.

**Conceptual Model/Theoretical FRAMEWORK –**

Is the framework explicitly expressed or must the reviewer extract the framework from implicit statements in the literature review? JUSTIFY your response!

No. The Framework is not explicitly expressed. The review of literature was collected from various published studies. The reviewer will have to extract the framework from implicit statements mentioned in the review of literature. Statements like self-management would involve complex regime and community based interventions would need to be referred for further clarification.

**Is the framework based on scientific, substantive, or tentative theory?**

The framework is based on substantive theory. Different interventions for type 2 diabetes have been studied. However, there is variation in individual interventions and further analysis of each intervention needs to be done. Some of them like, physical activity and diet have been proven to improve outcomes in type 2 diabetics. Hence the overall framework is based on substantive theory.

**Does the framework identify, define, and describe relationships among the concepts of interest? Provide examples and rationale for your response.**

Yes. The framework provides a direct relationship to the concept. The framework is based on previous research on self-management interventions for type 2 diabetics. Since the study involves the use of DSME on African-Americans, the framework identifies and directly relates itself to the concept.

**How is the framework related to the body of knowledge in nursing?**

Diabetes self-management education (DSME) would play an important role in advance nursing profession. It would help a nursing professional in educating a type 2 diabetic on different interventions to improve health. It enables the nurse to gain knowledge and enhance his/her potential in literature review and analysis. The framework would provide a background of advance research to the nursing profession.

**Review of the Related Literature**

Are the articles relevant with previous studies and theories described?

Yes. The article is based on scientifically published articles and theories. The article talks about using DSME as an intervention for type 2 diabetics. The authors of the study have gone through many articles based on DSME and patient self-management. They have reviewed more than 20 articles and research papers based on treatment interventions for type 2 diabetes.

Are the references current? Identify the number of sources within past 10 years and the number of sources within past five years.

There were a total of 45 references. Not many references were current or within the past 10 years. There were a total of 18 references within the past 10 years and only 5 references within the past 5 years. Since diabetes was a health problem from many years, authors preferred articles and research papers that were old enough but had significant data within them.

### **Describe the current knowledge about the research problem.**

There is no full-proof intervention for treatment of type 2 diabetes. Research only provides information on how the health issue could be improved.

Current research on type 2 diabetes only suggests different remedies for enhancing quality of life of type 2 diabetics. Immediate and full-proof studies need to be evolved for curbing type 2 diabetes.

### **Specify the gap in the literature that justifies the need for the research.**

The literature provides information on type 2 diabetes individuals from different ethnic groups. Literature involved only about individual self-management interventions. There was no significant study involved in African-American individuals. Thus there was a need for a combination of all self-management techniques on African-American type 2 diabetics.

### **Study METHODOLOGY**

Correlation quantitative methodology has been used for this study.

Correlation studies involve variables and their relationship with each other.

The study involves different variables to assess the overall outcomes of DSME in type 2 diabetics. (R. Ouyang, Kennesaw University)

Provide a clear description/definition of this methodology (in your own

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words); use an article or your text to support the definition and provide a citation.

Correlational statistics are used in correlation studies to determine the relation between variables in the study. Many variables are referred and data is gathered on the basis of these variables.

Why was the choice of this methodology appropriate for this study? JUSTIFY your response. The study was based on different variables. Methods like cause-comparative and experimental would not stand a chance for this study. The study was based on comparison of variables. In this case, individual self-management interventions were the variables and were compared with each other for best results. Correlational statistics was used for this study and hence correlational quantitative method was most ideal for this study.

## **Sample and Setting**

Identify inclusion and exclusion sample criteria.

The inclusion criteria for this study involved African-American individuals only. Individuals with only type 2 diabetes were included for the study. Age group was within 18 to 70 years. The study included both males and females for the study. Exclusion criteria included individuals with type 1 diabetes. An individual with coronary heart disease was not included in the study. Patients with cardiovascular ailments were not permitted in the study. Pregnant and pediatric groups were also not included for the study.

Indicate the method used to obtain the sample. Provide a definition of the method and discuss why it was an appropriate choice for this study



The study used stratified random sampling. Stratified random sampling involves separation of the population into 2 different sets. Samples from each set is then randomly drawn for the study. In this case, only African-American individuals were required. Firstly, individuals with type 2 diabetes formed the population under study. Two groups were made, with one group involving African-Americans. Then from this group, samples (individuals) were chosen for the study. Hence this was the most appropriate study that avoided bias and included only African-Americans.

The sample size was small in the study and included only 12 individuals.

There was no power analysis for this study since the study plan was small and easy to handle.

### **Identify the SPECIFIC characteristics (demographics) of the sample.**

The study was specifically for African-Americans with type 2 diabetes. Since the demographics was pre-determined, no specific characteristics had to be mentioned.

### **Identify the sample mortality (or attrition) number and percentage.**

There was no case of mortality in the study. Out of the total 13 cases, 1 left the study due to hospitalization. Hence the number of mortality is null.

### **Indicate the type of consent obtained and institutional review board approval.**

A consent form showing individuals with diagnosis of T2DM and having no serious medical problems. An informed consent form had to be filled by

individuals stating that they would be under supervision throughout the study. Compensation of 20\$ would be given to them at start and end of the study. Duke University institutional review board approved the study.

### **Identify the study setting and indicate if it is appropriate for the study purpose. JUSTIFY your response!**

The study was an observational research. Researchers used SADM to assess different variables and their impacts on type 2 diabetics. There was no drug therapy and hence requirement of a control was not necessary. Researchers had to only observe changes in individuals due to SADM. To assess the impact of SADM on individuals, different variables were assessed.

The researches could have performed a case-control study where-in controls could be a gold-standard that was primarily used for self-management in type-2 diabetics.

### **Identification and Control of Extraneous Variables**

Define extraneous variables

An undesirable outcome of an experiment or a clinical study can be due to a single variable or number of variables. Such variables influencing the outcome and results of experiments are termed as extraneous variables.

(Richard Hall, 1998)

What are the extraneous variables in this study? In what way(s) were appropriate measures used to control for the influence of the extraneous variables? Describe fully. If not addressed, explain how you know this and identify the extraneous variables you would note.

There were no extraneous variables observed in the study. It is due to the small sample size and stringent inclusion and exclusion criteria. Extraneous variables influence the overall study. Some extraneous variables interfere with other variables and cause false positives or false negatives. This would make the study a failure and incur losses. An extraneous variable in the form of disease that was not determined in an individual prior to study could change results. In this case, the unknown diseases diagnosed during the study would be an extraneous variable.

## **Study Instruments/Tools**

Identify the instruments used in the research

FOR EACH INSTRUMENT:

Instrument #1;

Discuss how the instrument was developed or purpose of use. Cite the source for the background information about the instrument.

The purpose of this scale is to assess the management goals by a diabetic individual. It would enable the experimenter or researcher to assess on the ability of the individual in self-management tasks and abilities. (Yuri N et al; 2007)

Identify the type of measurement strategy (e. g., Likert scale, visual analog scale, physiological Measure, questionnaire, observation, or interview).

The type of SADSM was a visual analogue scale. It consist of a horizontal line which is 100mm in length.

Identify the level of measurement (nominal, ordinal, interval/ratio) achieved by the measurement strategy. Provide a definition of the level of

measurement(s) you identified and justify WHY you believe the instruments represent this level of measurement.

The level of measurement was nominal. Numbers ranged from 1 to 10, where 10 would be the highest score depicting excellent self-management by the individual.

### **Report the reliability and validity of the instrument from previous studies and the current study.**

The validity and reliability of SADSM can be done by comparing it to gold standard. Gold standards include previously known instruments and tools that were used to assess self-management in type 2 diabetes. Some examples of gold standard are Diabetes Educator (D-ET) Tools and Diabetes Outcomes Intervention Tool (DO-IT). A report by Kathy Mulcahy revealed that SADSM is a valid and reliable instrument to assess self-management scores in type 2 diabetics. (Kathy M, 2000)<sup>4</sup>

### **Instrument #2;**

Discuss how the instrument was developed or purpose of use. Cite the source for the background information about the instrument.

Laurie Radloff created the Center for Epidemiological Studies Depression Scale (CES-D) in 1977. In 2004, it was altered and revised by William Eaton and a group of scientists. It is the most widely used tool in psychiatric epidemiology and is used to study depression in type 2 diabetics. (CESD-R, website, 20014)

Identify the type of measurement strategy (i. e. Likert scale, visual analog scale, physiological Measure, questionnaire, observation, or interview).

Unlike DASM, measurement strategy is done as a physiological measure. It consist of a questionnaire that would enable the researcher to assess the depth of depression in an individual.

Identify the level of measurement (nominal, ordinal, interval/ratio) achieved by the measurement strategy. Provide a definition of the level of measurement(s) you identified and justify WHY you believe the instruments represent this level of measurement.

The level of measurement is nominal and numbers range from 0 to 60. An individual with a score of more than 16 was considered to be depressed.

### **Report the reliability and validity of the instrument from previous studies and the current study.**

The reliability and validity of CES-D can be compared to a gold standard. A goal standard that could be used is Mini International Neuropsychiatric Interview (MINI). MINI is used to assess depressive disorders. In 2007, a study with Japanese workers validated the CES-D scale. (Wada K, et al; 2007)

### **Instrument 3#**

Instrument Name: Perceived Stress Scale (PSS)

Discuss how the instrument was developed or purpose of use. Cite the source for the background information about the instrument.

The PSS scale was developed to measure an individual's stress level. It is one of the widely used tools for the evaluation of stress levels in individuals. In the year 1983, PSS scale was first published. (Carnegie Mellon University)

Identify the type of measurement strategy (i. e. Likert scale, visual analog scale, physiological Measure, questionnaire, observation, or interview).

It consist of a series of questionnaire. There are 2 versions of questionnaire, 20 and 10 set question set. Depending on the level of symptoms, a researcher would decide which set of questionnaire would be used.

### **Report the reliability and validity of the instrument from previous studies and the current study.**

Confirmatory factor analysis (CFA) and SPSS can be used to validate the instrument. Reliability can also be checked using SPSS software. A study in Greece had assessed the validity and reliability of PSS in 2011. (Eleni Andreou et al; 2011)

### **Data Collection Methods**

Detail how the data were collected.

Data was collected using the Diabetes Self-Care Practices Measurement Questionnaire (DSCPM). The questionnaire helped in sample collection on basis of age, marital and economic status. Data using appropriate instruments were collected. Validity and reliability of each instrument were checked prior to study commencement. All data were stored electronically and kept secure. Some information were kept in multiple copies to avoid untoward incidents.

### **In what way(s) is the data collection procedures appropriate for this study?**

The data collection is accurate and precise. In quantitative research it is ideal that data be stored in multiple copies and in a secure place. All measures were taken for data security and accuracy. Advance tool-kits and

technology were employed for this study. Thus making the data collection the best for this study.

### **In what way were appropriate steps taken to protect the rights of the subjects?**

Participants were informed that they would be under study for the next 12 weeks before signing the informed consent form. Subjects were monitored carefully by health care professionals throughout the studies. No deviations in standard operating protocols (SOPs) were made. Any changes (minor or major) were informed to the participants. No participant reported severe health issue due to the study. Hospitalization of a single participant was reported. However, there was no relation of the health issue to the study being conducted.

### **Statistical Analysis Procedures**

Identify the statistical procedures used in the study:

Correlational Statistical method was used during the entire study. This was the only statistical procedure used in the study.

### **Statistical Procedure #1 (Name and definition):**

Correlation is a statistical method used to define the relationship between two variables. It is simple and accurate since it involve only numbers.

According to statistical definition, correlation would be the assessment of the association between two linear variables. (MM Mukaka, 2013)

## **How was it used in the study?**

The study consisted of 5 variables and their relation to type 2 diabetes.

Correlation statistical methods were used to assess the relationship of each variable to type 2 diabetes. Each variable had significance in the reduction of type 2 diabetes in the participant.

## **Complete the table below with the analysis techniques conducted in the study:**

What are the specific results of the study? Provide DEPTH and write IN YOUR OWN WORDS.

After self-management there was a decrease in total cholesterol in all 12 participants. All participants had high lipoprotein levels prior to study.

Adherence to DSMC decreased HDL levels in all participants. BMI of participants were evaluated after the end of 12 weeks and it was found that majority 95% of the participants had decreased BMI. Stress levels in subjects were reduced to a considerable level.

However there were no significant changes in HbA1c and depression. No changes in depressive scores were accounted post intervention. More than 50% of participants had scored high on the SADSM score card. Overall the study provided significant improvement in their health. There was an increase in quality of life. Although replication of study by inclusion of ethnic and control groups could provide a significant research outcome.

## **StrengthsLimitations**

What are two major strengths of the scientific merit of this study?

As a nurse, the study enlightened me about future trends in self-



management interventions of type 2 diabetes. The study was precise and accurate, the framework and methodology of the study was appropriate. It included sufficient statistical data and evidence to prove the hypothesis. The second strength is the use of advance tool-kits like DASM, CES-D, STAI and PSS. These are reliable and precise in measurement. The study also had a stringent exclusion criteria that provided a strong base for the study.

### **What are two major limitations of the scientific merit of this study?**

The study involved only African-American participants. Although, the study hypothesis mentioned that only African-American participants would be studied, it would not have a statistically significant approach. Involvement of a single ethnic group in a study is inappropriate and would be unreliable. Secondly, the sample size was small and results on such studied cannot be reliable.

### **How did the researcher generalize the findings?**

The researcher generalized findings based on individual outcomes. The researcher categorized findings into 5 distinct groups based on tool-kits. These were then appropriately generalized based on the measurements of each too kit. Average and extreme values were used to generalize the findings.

### **What did the researchers say the relevance of the data was? Describe the researchers' interpretation of the findings.**

The interpretation of the findings were based on statistical evidence and proven records. Feasibility and acceptability of interventions were thoroughly

examined by the researchers. The overall interpretation was scientifically accurate with precise data acquisition.

### **Where in nursing can the results of the data be applied?**

The data is accurate in terms of the ethnic group. The data can be applied for further studies in type 2 diabetic interventions. It could be used for advance nursing practices like patient education and improved diagnostic methods. The study could be further applied for African-Americans but for a larger population study.

### **What suggestions for further study were identified?**

Adopting new technology for measurement of different variables in the study was one of the suggestions. Another suggestion was the lack of large sample size and diverse ethnic group. If these two factors were implemented in further studies, precise results would be obtained.

### **Is the description of the study sufficiently clear for replication? Explain and justify your response**

Yes. The researcher has clearly mentioned about the replication of the study. The researcher clearly point out the flaws about the study conducted and the corrective methods for a more practical and precise study. The study could be replicated on basis of 3 aspects, Demographics, larger sample size and inclusion of a control group.

## **REFLECTION**

Reflect upon your newly developed understanding of quantitative research.

What has this experience critiquing a quantitative research study meant to

you and how will this make a difference in your overall practice of nursing?

Please provide depth and be sure you respond to the question. This is a subjective response and must be at least 2 full paragraphs. Please respond in reference to understanding quantitative methodology and not the specific focus of the research study.

There are many aspects that would enhance a nursing professional's knowledge in advance nursing practices. Firstly it enlightens a nurse about the protection of participants in research or study trial. As a nurse, I would make appropriate measures to ensure participant safety and follow guidelines of ICH-GCP (Good clinical Practices). The second aspect I learnt is the type of research design involved. Quantitative research enables me to understand and critically analyze the study outcomes. By quantitative research, nurses ensure to keep in mind, the sample size, data collection methods and the procedures carried out during a clinical trial.

Quantitative research has also improved my data interpretation and analyzing skills. It has improved the quality of learning and generalizing studies. Other than the study and the research being conducted,

Quantitative research has given be broad range knowledge that I could apply on a global level. This would include presentation of data, accuracy in study trials and the accessibility of the study to other nursing professionals. (Polit, D. F., & Beck, C. T. 2008)

### **What has the experience of reading and critiquing a quantitative study meant to you?**

Reading has improvised my ability to analyze complex data into a simpler and accurate form. Critiquing gave me the privilege of applying my nursing

knowledge to a real-life situation. It improved my ability in grasping knowledge and then interpreting data in a precise manner. Reading has also helped in improving my literature reviewing skills that would improve my ability in advance nursing practices. Critiquing on the other hand enabled me to evaluate statements and the hypothesis used in the study. Overall, it enlightened me in advance research practices.

### **How will understanding and using quantitative research findings make a difference in your practice of nursing?**

Quantitative research is precise and accurate. It would enable nursing professionals to generate accurate and generalized results. Quantitative research findings are reliable and reproducible. Solving and researching complex data would be easier using quantitative research methods. (Carr LT., 1994)

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