

A Quantitative Research Critique

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Abstract

The following paper is a critique of the research article, “The Use of Personal Digital Assistants at the Point of Care in an Undergraduate Nursing Program” (Goldsworthy, Lawrence, and Goodman, 2006). The purpose of this critique is to evaluate the content within each section of the article. The critique is guided by Nieswiadomy’s research critique guidelines (2008). In the critiqued article, Goldsworthy et al. (2006) outline a study examining the relationships between the use of personal digital assistants and self-efficacy and the preparation for medication administration among nursing students (p. 138).

Keywords: research, personal digital assistant, self-efficacy, student

A Quantitative Research Critique

The purpose of this paper is to critique the research article, “The Use of Personal Digital Assistants at the Point of Care in an Undergraduate Nursing Program”, published in *CIN: Computers, Informatics, Nursing* (Goldsworthy, Lawrence, and Goodman, 2006). Nieswiadomy’s *Foundations of Nursing Research* (2008) text will be used to guide the critique. By utilizing Nieswiadomy’s research critique guidelines, we will evaluate the strengths and weaknesses of the research process to determine its usefulness as evidence.

Purpose and Problem

Evidence

The research article, written by Goldsworthy et al. (2006), speculates the use of Personal Digital Assistants (PDAs) among student nurses (p. 138). The authors begin by discussing the purpose, the demands on clinical judgment and critical thinking skills for beginning or student nurses and the need for them to be able to quickly retrieve and process information to make the safest patient care decisions (Goldsworthy et al., 2006, p. 138). They go on further to describe the necessary resources of student nurses in a clinical environment such as drug, laboratory, and pathophysiology books, calculators, notes, etc. and claim that the student, equipped with a PDA, can do away with these “awkward” resources (Goldsworthy et al., 2006, p. 138).

The problem statement of the study was to “examine the relationships between the use of personal digital assistants and self-efficacy and the preparation for medication administration among second-year Bachelor of Science in Nursing students in a medical-surgical clinical environment” (Goldsworthy et al., 2006, p. 138). The authors also explain that the study

attempted to support claims about the educational benefits of PDAs (Goldsworthy et al., 2006, p. 138).

Support

There are some factors that must be considered when determining if a topic is appropriate for a research study. Nieswiadomy (2008) describes these factors to include ethical issues, significance to nursing, personal motivation and qualifications of the researcher, and feasibility of the study (p. 77). Feasibility of the study means that the researcher needs to be sure that the study can actually be carried out (Nieswiadomy, 2008, p.79). The research problem statement meets important criteria if is written in interrogative sentence form, includes the population and the variables, and is empirically testable (Nieswiadomy, 2008, p. 79). Nieswiadomy (2008) explains that the clearest way to identify the problem area of a study is to use a question format to state the research problem (p. 80). She further explains that if a declarative sentence is used to describe the problem area, the goal of seeking an answer to the problem does not seem as clear (Nieswiadomy, 2008, p.80). She also states that, in the problem statement, the population should be narrowed down to the main group of interest and the variables to be studied should be clear (Nieswiadomy, 2008, p. 81). The final criterion that Nieswiadomy describes concerns the empirical testability of the problem statement. She explains that “testable problems contain variables that can be measured by the researcher” (Nieswiadomy, 2008, p. 83). Empirical data is data that can be gathered through the sense organs and for a problem statement to be empirically testable, empirical data must be available about the variable or variables (Nieswiadomy, 2008, p. 83). A well-written purpose and/or problem statement in a research study would meet all of the above guidelines.

Analysis

The first part in analyzing the purpose/problem section of a research article is to determine whether the purpose/problem is clear. Goldsworthy et al. (2006) adequately explain the purpose of the study in describing all the necessary resources that student nurses need to make safe patient care decision and further claim that the use of a personal digital assistant (PDA) will help the student to retrieve and process information quickly (p.138).

The actual problem statement was a little more difficult to pinpoint. Nieswiadomy (2008) states that the use of a question format to state the research problem is the clearest way to identify the problem area of a study (p. 80). Goldsworthy et al. (2006) do not do this; rather they use a declarative form to state the problem: “This study examined the relationships between the use of personal digital assistants and self-efficacy and the preparation for medication administration among second-year Bachelor of Science in Nursing students in a medical-surgical clinical environment (p. 138). However, Nieswiadomy (2008) does point out that many problem statements in literature are written in the declarative form (p. 81).

Goldsworthy et al. (2006) have included the population in the problem statement to be second-year Bachelor of Science in Nursing students in a medical-surgical clinical environment (p. 138). Nieswiadomy (2008) state that the population should be narrowed down to the main group of interest which the authors of the article have done (p. 81). They also include the variables in the study. The use of personal digital assistants is an independent variable while self efficacy is the dependent variable (Goldsworthy et al., 2006, p. 138). There is a third variable in the problem statement, the preparation for medication administration, which is also a dependent variable (Goldsworthy et al., 2006, p. 138). The problem statement does indicate that empirical data could be gathered on the topic. Nieswiadomy (2008) claims that for a problem statement to

be empirically testable, empirical data must be available about the variables (p. 83). For the first variable identified by Goldsworthy et al. (2006), the use of personal digital assistants, one could physically gather data by identifying the student nurses who are using the PDAs (p. 138). The second variable, self-efficacy, is measurable by gathering data on the verbalized increase of this variable by the student nurses and also by assessing the perceived self efficacy of the students. The third variable, the preparation of medication administration, is also measurable by gathering empirical data. Data that could be gathered include the verbalized preparedness of medication administration of the student nurses as well as by assessing their preparedness.

The next area to analyze in critiquing the problem statement is whether the feasibility of the study is apparent in reading the problem statement (Nieswiadomy, 2008, p. 85).

Nieswiadomy (2008) explains that a study to be feasible, many questions need to be answered: time needed to carry out the study, cost, supplies needed, support, and availability of the subjects (p. 79). In reading the problem statement of the article by Goldsworthy et al. (2006), it is apparent that the study is feasible (p. 138). The study would take an appropriate amount of time. The major cost of the study would be the purchase of the PDAs, which I believe would be expensive but feasible. I think the study could be supported by administration and by peers and the subjects, student nurses, would be readily available.

The final question to be answered in critiquing the problem statement is whether the significance of the study to nursing is apparent (Nieswiadomy, 2008, p. 85). I think the study is of significance to nursing. If the use of PDAs among nursing students were found to increase self efficacy and preparation for administration of medication, they would in turn provide safer patient care and be more likely to excel in school (Goldsworthy et al., 2006, p. 138).

In overall analysis of the purpose and problem statement in the article written by Goldsworthy et al., the purpose of the study is easily identified and clearly stated. The problem statement is clear and meets the criteria necessary for a problem statement. The only weak area that I was able to identify was that the problem statement was written in declarative rather than interrogatory sentence.

Review of Literature

Evidence

The literature review in the study “The Use of Personal Digital Assistants at the Point of Care in an Undergraduate Nursing Program” is lacking in the amount of previous research especially when it comes to nursing students. The review did not describe the evidence or the previous research in detail or explain the studies, data, or variables. The evidence did favor the use of PDAs but not pertaining to nursing students.

Support

Although there are not many studies done that support the research regarding using PDAs to improve nursing student’s experience there are a few articles that show it may improve confidence and save time. One of the reviews titled “Handheld” studied 9 internal medicine residents using the device and results suggested improved clinical comfort and increased learning (Goldsworthy et al., 2006, p. 139). Another study compared hand held computers with traditional documentation for nurses and results showed PDAs saved time and decreased errors. It describes the results as improving self-efficacy and improving documentation (Goldsworthy et al., 2006). The article reviewed lacks clarity and does not offer support directly related to the use by nursing students.

Analysis

This research may be too new and have issues with the way data was collected. Being that it is more of a pilot study it could be a guide for future studies and help improve the use of technology in nursing. It may not be considered as important of a study if no other research exists. It is difficult to compare and evaluate the results, measure the different variables, and check the relevance of the sources. Also, the study may lack alternatives to PDA use or techniques or an opposing viewpoint (Nieswiadomy, 2008). Overall, it may be hard to apply due to lack of research. The analysis also suggests the study on PDAs may be unbiased due to lack of previous research. The article tries to develop a new theory. It is also a form of applied research that can be used to change the practice and solve the issue of students carrying too many references and materials and having very little time to react to challenges on the clinical units (Nieswiadomy, 2008).

Theoretical/ Conceptual Model**Evidence**

The article discusses the relationship between the use of PDAs and self-efficacy among nurses (Goldsworthy et al., 2006). They explain that, because the study examined self-efficacy, literature associated with self-efficacy related to nursing was reviewed (Goldsworthy et al., 2006). The theory that they are basing their framework on is Bandura's Social Cognitive Theory (Goldsworthy et al., 2006). "Self-efficacy has been found to be related to academic success in nursing" (Bandura A., 1986, as cited in Goldsworthy et al., 2006, p. 139). Goldsworthy et al. go on to further explain self-efficacy as the "belief in one's capabilities to organize and execute the sources of action required to manage prospective situations" (Schwarzer R. and Jerusalem M., 2000, as cited in Goldsworthy et al., 2006, p. 139). They claim that individuals with higher self-

efficacy will persist when challenged and will feel that they can achieve success in a situation (Goldsworthy et al., 2006, p. 139).

Support

Nieswiadomy (2008) states that a theoretical or conceptual framework should be used in all quantitative studies. A theoretical framework presents a general explanation of the relationships between the concepts of interest in a research study, based on one existing theory (Nieswiadomy, 2008). A conceptual framework helps explain the relationship between the concepts but this type of framework links concepts from several theories (Nieswiadomy, 2008). Nieswiadomy (2008) further reasons that nursing studies should be based on a theoretical or conceptual framework so that the findings may be placed within the existing knowledge base for the profession. The study framework of an article should be clearly identified and may be based on either a nursing theory or a theory from another discipline (Nieswiadomy, 2008). The framework must be appropriate for the study and it must be determined if there is a thorough explanation of the concepts and their relationships to each other (Nieswiadomy, 2008). While the entire theory is rarely tested in one study, there should be a specific proposition from the theory that will guide the hypothesis or research questions. Finally, there should be operational definitions provided for the concepts that will be measured in the study (Nieswiadomy, 2008, p. 119).

Analysis

In analyzing the study the first question to answer is whether the framework is clearly identified. Goldsworthy et al. (2006) discuss the relationship between PDA use and self-efficacy use early in the paper, as early as the abstract, therefore making it easier to identify the framework as it was assumed to be based on self-efficacy. Nieswiadomy (2008) states that

sometimes the research report contains a heading for the framework section of the study but other times the discussion of the framework is included in the introductory or review of literature section (p. 118). Goldsworthy et al. (2006) discuss self-efficacy in the review of literature section stating that literature associated with self-efficacy relating to nursing was reviewed and they reference Bandura's Social Cognitive Theory (p. 139). They do not, however, discuss or even mention his theory in the text of their article. The framework that is identified, while not very clear, is based on a theory from the discipline of psychology. Bandura's Social Cognitive Theory appears to be appropriate for the study in that he claims that self-efficacy has been found to be related to academic success in nursing (as cited in Goldsworthy et al., 2006, p.139). The concept of self-efficacy is clearly defined. Goldsworthy et al. (2006) explain that self-efficacy describes how individuals will react in a challenging situation (p. 139). The relationships among the concepts are clearly presented by the propositional statements: "Individuals with higher self-efficacy will persist when encountering obstacles and will feel that they can achieve success in a situation" and "Studying PDA use in student nurses will provide evidence on whether this technology will enhance one's self-esteem or not" (Goldsworthy et al., 2006, p.139).

Overall, I think this is a fairly strong section of the research. While the theoretical framework is not clearly identified in the article at first, it is apparent that the article is based on self-efficacy and Bandura's Social Cognitive Theory after thoroughly reading and examining the cited references. All other criteria for the study framework are met.

Hypothesis and Research questions

Evidence

The hypothesis proposed in the article is found at the end of the literature review. It states that "Studying PDA use in student nurses will provide evidence on whether this technology will

enhance one's self-esteem or not" (Goldsworthy et al., 2006, p. 139). It relates to the problem statement part 1B "Does the use of a PDA by second-year Bachelor of Science in Nursing students in medical-surgical environment enhance the students' self-efficacy?" (Goldsworthy et al., 2006, p. 139).

Support

Hypothesis criteria are very specific as presented by Nieswiadomy. They include being written in a declarative sentence, being in the present tense, containing the population and variables, reflecting the problem statement, and being empirically testable (Nieswiadomy, 2008, p.132). There are simple and complex hypothesis depending on the number of variables (Nieswiadomy, 2008). A Null hypothesis predicts that no relationship exists between the variables and a research hypothesis is an expected relationship (Nieswiadomy, 2008). There are nondirectional and directional hypothesis. Nondirectional is when the researcher predicts that a relationship exists (Nieswiadomy, 2008). Directional is when the researcher predicts the type of relationship (Nieswiadomy, 2008).

Analysis

There is nothing in the hypothesis that can be empirically tested. The statement is written in the present tense. It is a simple hypothesis containing 1 independent variable, PDAs, and 1 dependent variable, self-esteem. It is a directional research hypothesis because the researcher predicts the type of relationship being that the PDAs increase the students' self-esteem. The article presents a hypothesis that is limited and vague. Although the research questions were clearly defined the hypothesis is lacking or nonexistent. The hypothesis does seem to be derived from the literature and findings from other studies (Nieswiadomy, 2008). It is possible that the

research did not fully test all parts of the problem because of an incomplete hypothesis. Overall, it is possible that no hypothesis exists within this article.

Research (Study) Design

Evidence

The study by Goldsworthy et al. (2006) used a controlled experimental method in attempt to support claims about the educational benefits of personal digital assistants (p. 138). The sample consisted of 36 students, two groups with PDAs and two groups without PDAs to serve as a control. There were two professors, each one responsible for a PDA group and a control group (Goldsworthy et al., 2006). Goldsworthy et al. (2006) further explain that all the groups were administered a pre- and post-general self-efficacy instrument with the pretest being administered before the study and the posttest 8 weeks after the study.

Support

Nieswiadomy (2008) discusses the concept of research design and explains that the design is not concerned with the specific data-collection methods but with the overall plan for gathering data. According to Nieswiadomy (2008), the research design should be able to be identified in the research report and a determination made if the design is appropriate for the appropriate. The main consideration when critiquing the research design concerns the ability of the study to test the hypothesis or answer the research questions (Nieswiadomy, 2008).

Nieswiadomy (2008) explains that quantitative designs are divided into experimental and nonexperimental designs. Experimental studies involve manipulation or control of the independent variable and measurement of the dependent variable, cause-and-effect relationships (Nieswiadomy, 2008). If the study used an experimental design, the means used to control for threats to validity should be identified (Nieswiadomy, 2008).

Analysis

The first area of assessment in analyzing the research design is in identification of the design. Goldsworthy et al. (2006) state within the abstract that a controlled experimental method is used (p. 138). Because they explain that the sample consisted of 36 students who were randomly assigned to either a PDA or a control group and that all groups were administered pre- and post-general self-efficacy tests, I can conclude that the design used was the pretest-posttest control group design (Goldsworthy et al, 2006). Nieswiadomy (2008) explains that in this type of design the subjects are randomly assigned to groups, a pretest is given to both groups, the experimental group receives the experimental treatment while the control group receives the routine treatment, and a posttest is given to both groups. The design was appropriate to answer the research question of whether the use of PDAs by nursing students would enhance the students' self-efficacy because the pre- and posttest specifically measured self-efficacy (Goldsworthy et al., 2006). The pretest-posttest control group design controls for all threats to internal validity but there is concern for the reactive effects of the pretest as a threat to external validity (Nieswiadomy, 2008). The reactive effects of the pretest occur when subjects have been sensitized to the treatment through taking the pretest (Nieswiadomy, 2008). To control this threat, one other test was used to confirm that the experimental and control groups did differ with regard to their measured progress in self-efficacy (Goldsworthy et al., 2006).

Overall, the research design by Goldsworthy, Lawrence, and Goodman easily identified and appropriate for the study to answer the research questions and allowed the researcher(s) to draw a cause-and-effect relationship

Sample and Sampling Methods

Evidence

The research article information regarding population and sample is found in the section on methods. The population is nursing students. The sample is 36 second-year baccalaureate nursing students in south eastern Ohio in a medical/surgical clinical unit. They were divided randomly into groups consisting of 2 control groups and 2 PDA groups. The only specific information given about the sample is there education level, the ethics and confidentiality training provided, and that both groups were given the same resources either paper or PDA format. The target population appears to be either students receiving medical education and/or hospital workers in a clinical area (Goldsworthy et al., 2006).

Support

The Nieswiadomy text explains the population as the complete set of persons or objects with related characteristics (Nieswiadomy, 2008). There are 2 subgroups. The target population consists of the larger population to which the findings can be generalized for. The other group is the accessible population which is available to take the sample from (Nieswiadomy, 2008).

The sample is a subset of a population. There is a method of selecting a sample. The size of a sample determines how representative it is of the total population (Nieswiadomy, 2008). There can be probability (random) or nonprobability (nonrandom) methods to select a sample group. The characteristics of the study determine which sampling is most appropriate. Sample groups can be studied over time as a longitudinal study or at a specific point in time as a cross-sectional study (Nieswiadomy, 2008). A larger sample size may be best to determine if the study represents the population. Samples as small as of 30 may be adequate especially if there is a homogeneous population. Sampling error may result if the data does not match that of the

population and sampling bias occurs when the sample is not properly selected (Nieswiadomy, 2008, p. 203).

Analysis

The sample was clearly identified in the methods section in the Goldsworthy article. The population was not stated directly. The target population is large and nonspecific. The accessible population is the local universities group of second year nursing students. Not many characteristics of the group are described. There is no mention of their age or gender.

The sample size of 36 students may be enough to represent the population. The only rationale provided for the small sample size was “availability of suitable instruments” (Goldsworthy et al., 2006). There is no specific discussion as to how the samples were formed just that it was a random selection (Goldsworthy et al., 2006). The sample of students who completed both the pre and post-test was $n=12$. So the results of the research do not match the studies original sample.

Overall, the populations are identified but not in detail. The sampling method is random but the method is not described well enough. There are things lacking about the sample and it may not be the best representation of the population. There is no bias discussed or reasons for the drop in sample number. The article could have expanded in the description of the population and sample.

Data Collection Methods

Evidence

The article collected data from the nursing students by using a pre-test and post-test, given 8 weeks later, to ask questions regarding their self-efficacy when using a PDA compared to the control group. The instrument used consisted of 10 items. The article states “The general

self efficacy scale aims at a broad and stable sense of personal competence to deal efficiently with a variety of stressful situations” (Goldsworthy et al., 2006).

The study also attempted to examine the safety of medication administration using the PDA. The article states “the designed instrument for this proved to be too cumbersome for the instructors to complete in the fast-paced clinical environment” (Goldsworthy et al., 2006). The article suggests using another method in future studies such as a dedicated observer who can take the time thoroughly review the student’s documentation (Goldsworthy et al., 2006).

Support

A questionnaire is a self-reporting instrument used to measure knowledge levels, opinions, attitudes, beliefs, ideas, feelings, and other human responses (Nieswiadomy, 2008). It is a popular way to measure nursing research.

There are different instruments to use for self-report data-collection such as Likert Scales which participants to rate responses ranging from strongly agree to strongly disagree (Nieswiadomy, 2008) and semantic differential scales that has subjects indicate there position on a continuum between two phrases related to the concept being measured (Nieswiadomy, 2008).

Analysis

Although the data-collection method for measuring self-efficacy is clearly described as a questionnaire for the students there are no details on the questions asked, types of questions, or instructions. Using a questionnaire would be appropriate for this study because the measurement is based on before and after changes in self-efficacy which is a human response to an experiment. The article did state that there were 10 questions used, there were tables showing the responses, and it appears the students had some anonymity.

The study did not indicate which type of self-report instrument was used. It was a self-

reported design to study self-efficacy so there were little options for using a physiological method. Only one method was used to collect data. It may have been beneficial to use other measures such as an observer. Overall, the method was appropriate for the study but the article does not provide enough details on the type of questions asked.

Instrument

Evidence

Goldsworthy et al. (2006) explain early in their article that the study, in addition to being a case-control experiment, is intended as a pilot study for how formal testing might be conducted in the educational context. It is further explained in their article that the groups in the study were administered a pre- and post-general self-efficacy instrument (Goldsworthy et al., 2006). There were two instruments used in the study. The first one described by Goldsworthy et al. (2006) was the 10-item General Self-Efficacy instrument. The coefficients for this tool range from .75 to .90 (Goldsworthy et al., 2006).

The second instrument used was a safety tool for medication administration developed by the authors (Goldsworthy et al., 2006).

Support

An individual should be able to determine, when reading a research report, if the measurement and collection of data has been conducted appropriately (Nieswiadomy, 2008, p. 226). When making this determination, the following questions should be answered: what data were collected, how the data were collected, who collected the data, where the data were collected, and when the data were collected (Nieswiadomy, 2008). A determination should also be made if the level of measurement that was used to measure the research variables was appropriate (Nieswiadomy, 2008). The research instruments should be clearly described with

information regarding their reliability and validity. Lastly, it should report if a pilot study was conducted using instruments and the results reported (Nieswiadomy, 2008)

Analysis

In analyzing the measurement and data collection section of the article, I found the information to be lacking some important information. Following the guidelines provided by Nieswiadomy (2008), as mentioned above, the article does answer the initial questions of what data were collected, how the data were collected, who collected the data, and where and when the data were collected. Goldsworthy et al. (2006) explain that the data collected were measurements of self-efficacy and preparedness for medication administration of 36 second-year nursing students. The data were collected with self-efficacy instruments and a safety tool for medication administration (Goldsworthy et al., 2006). Goldsworthy et al. (2006) state that the study took place in two southeastern Ontario hospitals under the direction of two professors. The final question, when were the data collected, is answered by Goldsworthy et al. (2006) stating that the pretest was administered before the study started and the posttest was administered 8 weeks later. The second guideline asks whether the appropriate level of measurement was used to measure the variables. The study measured the differences in scores on the pre- and posttest self efficacy instruments (Goldsworthy et al., 2006). The level of measurement is the ratio level of measurement because the data can be ranked and categorized, the distance between ranks can be specified, and a zero point can be identified (Nieswiadomy, 2008). The zero point would be identified as no difference in the scores on the pre- and posttests. This level of measurement is appropriate to measure the research variables. The data-collection were described in the in the instruments section of the article but the description of the tools was vague. The description of the self-efficacy tool includes simply the name of the instrument and the range of the coefficients

(Goldsworthy et al., 2006). The safety tool for medication administration was developed by the authors of the article. While there is an example of the tool in the article, there is no further description of it (Goldsworthy et al., 2006). Goldsworthy et al. (2006) state that the safety tool for medication administration was developed by themselves but they do not provide any information on whether the General Self-Efficacy instrument had been previously used. The article does not contain any information as to whether the instruments were tested for reliability and validity. The final question in Nieswiadomy's guidelines asks if a pilot study was conducted using the instruments. Goldsworthy et al. (2006) explain that this study is intended as a pilot study for how formal testing might be conducted in the educational context.

Overall, I think the measurement and data-collection section is weak in that it does not provided a more detailed description of the instruments used. It does not provide any information on the reliability or validity of the instruments. In general, it includes very little information on measurement and data-collection.

Data Analysis (Descriptive and Inferential Statistics)

Evidence

The article provides very little information on the statistics used for the study aside from the information provided in the results. Goldsworthy et al. (2006) explain that there were two tests, pretest and posttest, administered to the 36 second-year baccalaureate nursing students. The coefficients used for the tools ranged from .75 to .90 (Goldsworthy et al., 2006). The authors explain that a paired-sample *t* test was used for the students' results.

Support

The statistics of the study should be clearly presented in the research report with enough information for the reader to be able to make a determination of whether or not the appropriate

tests were used (Nieswiadomy, 2008). The calculated value of the inferential statistic, the degrees of freedom, and the level of significance should be presented for each hypothesis that was stated in the study. The results of the tests should be clearly and thoroughly discussed and presented both in the text and in the tables (Nieswiadomy, 2008).

Analysis

Goldsworthy et al. (2006) present the results of the tests in both the text and in the tables but provide very little information on the statistics used prior to the study results. Based on the inadequate information provided about the statistics it is difficult to make a determination of whether or not the appropriate tests were used. The authors also did not provide the calculated value of the statistic, the degrees of freedom, or the level of significance that was obtained.

Study Findings

Evidence

With respect to the self-efficacy pretest, all groups were homogeneous: the mean pretest score for the combines PDA groups was 32.539; the mean for the control groups was 32.500 (Goldsworthy et al., 2006). The tests' results were illustrated in two separate tables: Table 2, Self Efficacy Pretest and Table 3, Self Efficacy Posttest. The mean score on self-efficacy increased from 32.539 on the pretest to 36.308 on the posttest for the PDA students who took both tests. Using a paired-sample *t* test for these students' results, this increase was significant ($P < .001$) (Goldsworthy et al., 2006). The scores of the non-PDA students increased, on average, by only 0.667 (from a mean of 32.500 on the pretest to 33.167 on the posttest). Using a paired-sample *t* test, this increase was not significant ($P = 0.166$) (Goldsworthy et al., 2006).

The authors explain that these quantitative findings are consistent with evidence of the PDA student's experiences (Goldsworthy et al., 2006). The students reported finding the PDA

very helpful in its capacities as a drug book, lab book, PDQ/medical-surgical tips provider, and class notes recorder (Goldsworthy et al., 2006).

The authors also explain that the second objective of this pilot experiment was not able to yield clear results (Goldsworthy et al., 2006). The researchers intended to monitor drug-administration errors among the students in the study and to compare the performance of the PDA and non-PDA students. Goldsworthy et al. (2006) state that the designed instrument for this proved to be too cumbersome for the instructors to complete in the fast-paced clinical setting. The authors conclude in their presentation of the results by stating that they believe it has been demonstrated that the potential advantages of PDAs in nursing education can be subject to formal, case-control experimentation, to move beyond simply anecdotal and disruptive claims of potential benefits (Goldsworthy et al., 2006).

Support

“The findings of a study are the presentation of the results in the form of empirical data or facts” (Nieswiadomy, 2008). The findings should be presented clearly and concisely and always objectively. Each hypothesis or research question should be addressed separately and the findings described in relation to the study framework (Nieswiadomy, 2008). The findings should be compared to other studies discussed in the literature review section of the report and the investigator should discuss the limitations that may have influenced the findings. There should also be discussions of both statistical and clinical significance (Nieswiadomy, 2008).

Analysis

The results of the study, while not fully inclusive, were presented clearly and concisely. The authors presented the findings objectively, providing the scores of both the PDA students and the non-PDA students on the self-efficacy pre- and posttests. The research question posed

by the authors included PDA use on both improving the student's self-efficacy and on improved medication administration by the students. The authors addressed both of these questions separately in the findings section and described them in relation to the study framework. The authors did not compare the findings to the findings of other studies discussed in the literature review section. Limitations that the authors discussed were related to the research question that addressed medication administration but they did not address any limitations related to the measurement of self-efficacy. Finally, the authors discussed both statistical and clinical significance of the study results.

Overall, the results section was well-written. It included the majority of the recommended information with the exception of limitations and comparisons to the literature review.

Study Conclusions, Implications, & Recommendations, Recommendations

Evidence

The recommendations and conclusion in the study "The Use of Personal Digital Assistants at the Point of Care in an Undergraduate Nursing Program" suggest that more studies should be done to explore the use of PDAs in other clinical settings (Goldsworthy et al., 2006). The conclusion is that the results show an increase in undergraduate's self-efficacy when using the PDAs (Goldsworthy et al., 2006).

Support

Nieswiadomy states that the recommendations should offer more questions and suggest further research or an extension of the study completed (Nieswiadomy, 2008). Also, the conclusion should generalize the findings, state the study problem, and include the sample size and population (Nieswiadomy, 2008).

Analysis

The article does meet objectives for this section but could include more recommendations for research and a more detailed conclusion so the reader has an opportunity to see the full impact of the study and future use of the ideas.

Conclusion

This research critique has evaluated the research article by Goldsworthy et al. (2006) using Nieswiadomy's research critique guidelines (2008). We have critically appraised each main section of the article to determine strength and weaknesses of the research process. During this process, we have determined several areas of needed improvement in the presentation of the research report. Overall, it should be noted that this is a rather weak source of evidence related to the use of personal digital assistants by nursing students. The design of the study is poorly explained and provides no information of the means used to control for threats to validity. A more thoroughly written research report would strengthen this article for use as evidence.

References

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Research Critique

Grading Criteria

APA Format: up to 30 points or 30% can be removed after the paper is graded for Title page, abstract, headers Margins, spacing, and headings, reference page, title page, abstract
Sentence structure, spelling, grammar & punctuation.

| <u>Headings</u> | <u>Possible Points</u> | <u>Points Earned</u> | <u>Comments</u> |
|---|-------------------------------|-----------------------------|------------------------|
| Abstract and Introduction: No heading for intro, but there should be a introduction of the study and what your paper will address, why you are doing the critique | 10 | | |
| Purpose & Problem Statement (Identify the problem & purpose and analyze whether they are clear to the reader. Are there clear objectives & goals? Analyze whether you can determine feasibility and significance of the study) | 10 | | |
| Review of the Literature and Theoretical Framework (Analyze relevance of the sources; Identify a theoretical or conceptual framework & appropriateness for study) | 10 | | |
| Hypothesis(es) or Research Question(s) (Analyze whether clearly and concisely stated; discuss whether directional, null, or nondirectional hypothesis[es]) | 10 | | |
| Sample & Study Design (Describe sample & | 10 | | |

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|---|------------|--|-------------|
| <p>sampling method & appropriateness for study; analyze appropriateness of design; discuss how ethical issues addressed)</p> | | | |
| <p>Data Collection Methods & Instruments (Describe & analyze the appropriateness of the what, how, who, where and when; describe & analyze reliability and validity of instrument)</p> | 10 | | |
| <p>Data Analysis (Describe descriptive & inferential statistics & analyze whether results are presented accurately & completely)</p> | 10 | | |
| <p>Discussion of Findings (Analyze whether results are presented objectively & bound to the data, whether there is a comparison to previous studies and whether new literature is introduced that was not included in the Literature Review)</p> | 10 | | |
| <p>Conclusions, Implications, & Recommendations (Analyze whether the conclusions are based on the data, whether hypotheses were supported or not supported, whether implications are a result of the findings, and recommendations consider limitations)</p> | 10 | | |
| <p>Your paper should end with a brief conclusion of your critique</p> | 10 | | |
| <p>PAPER POINTS</p> | 100 | | |
| <p>Deductions for APA, grammar and Spelling</p> | | | Final GRADE |