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The Use of Active Methodology in Knowledge About Arteriovenous Fistula

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ABSTRACT

Introduction: the use of active methodology in the application of nursing students' knowledge about arteriovenous fistula is a very pertinent topic, seeking a better understanding of the content by students.

Objective: to evaluate the use of active methodology for better understanding of content by nursing students using a board game.

Method: an analytical, descriptive, experimental study was carried out with a quantitative approach. The pre-test was applied to two groups, one being a traditional group and the other an intervention group. A class on irrigation and drainage of the upper limb and arteriovenous fistula was given to both groups. A board game related to anatomy and arteriovenous fistula was developed and then applied to the intervention group. The post-test was applied to both groups to compare results. For data analysis, the Wilcoxon test was used, with data showing $p<0.05$ being considered significant.

Result: regarding the comparison between pre-test and post-test after using the active methodology, it is possible to note that there was a statistically significant difference between the results of the two groups.

Conclusion: the present study showed that the board game used as an active methodology is a viable tool that contributes to bringing knowledge to nursing students.

Keywords: Knowledge; Arteriovenous fistula; Nursing; Teaching; Active methodology.

Introduction

Chronic kidney disease (CKD) consists of kidney damage with progressive and irreversible loss of kidney function[1]. In the most advanced stage, the nephrons lose their blood filtration function and end up overloading the other organs, triggering the late stage of chronic renal failure, the kidneys become unable to regulate the body's homeostasis, causing a collapse in the body, requiring treatment. hemodialysis in patient care[2].

It is estimated through a study carried out by World Kidney Day (2023), that 10% of the world's population develops chronic kidney disease, which triggers increasing levels of mortality in the population. Comorbidities are directly linked to the incidence of this disease, in the case of Brazilians, the main causes include hypertension, which affects approximately 34 million people, and diabetes, which affects approximately 9 million individuals[3].

According to the latest Brazilian Dialysis Survey, approximately 145 thousand patients received kidney dialysis treatment in Brazil in 2020; and 92.6% on hemodialysis treatment, AVF creation has been highly recommended as a vascular conduit to initiate hemodialysis with lower morbidity[4,5].

Hemodialysis is a procedure carried out to clean and filter the blood, keeping blood pressure controlled and helping the body maintain the balance of chemical substances such as sodium, potassium and chlorides. organism, in which an arteriovenous fistula is created, connected to the machine that carries out the work previously carried out by the kidneys[6].

The arteriovenous fistula (AVF) is a surgical procedure in which a vein is connected to an artery, forming a larger access, allowing multiple punctures to perform hemodialysis. perform the first puncture, it takes 8 to 12 weeks for maturation [7]. Among the existing AVFs, Radio-Cephalic is usually the first choice, other options can be considered such as Brachio-cephalic and Brachio-basilica[8].

The nursing team has greater accessibility to the patient, taking into account that they are the ones who provide continuous care to the patient, it is necessary for the team to have prior knowledge about arteriovenous fistulas, so that they know how to identify and avoid possible complications or loss of access . The nurse is responsible for guiding his team, patients and family members about the necessary care that must be taken into consideration for the good functionality and stability of the fistula[9].

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The early transition to the area of nephrology influences academic-professional training, from nursing care, client self-care to access and mapping of problems that affect the preservation of AVFs. In this way, the development of nursing research is essential because allows you to build your own knowledge, which allows you to offer the client better nursing care based on scientific knowledge, enriches practical and professional knowledge and allows you to find solutions to problems experienced in everyday life[10].

Materials and Methods

This research is an analytical, descriptive, experimental study with a quantitative approach. This study was carried out at the University of Rio Verde (UniRV) at the Faculty of Nursing.

The inclusion criteria were students enrolled in the Nursing Course, studying the 2nd and 8th period, aged over 18 years old and the exclusion criteria were students from other Higher Education Institutions (HEIs) and students on leave.

Subsequently, they were divided into two traditional groups and an intervention group. The traditional group was made up of 8th period nursing students who were subjected to the traditional methodology. The intervention group was made up of students from the 2nd period and was subjected to the traditional method and the board game.

The 24 objective questions were planned and prepared to carry out the pre-test and post-test to check the students' knowledge before and after applying the traditional methodology and the active methodology on irrigation and drainage of the upper limb and arteriovenous fistula. The pre- and post-test tests were marked by an evaluator and received a score ranging from 0 to 24.

The first stage corresponded to the elaboration and development of the board game. The second stage corresponded to the explanation and execution of the game in the classroom, for the intervention group. The resolution of the questions was done on a free time basis, and the student who was unable to answer the proposed questions would not advance to the next phase.

This research was approved by the Research Ethics Committee of the University of Rio Verde with Opinion number: 6,109,369 and data collection was carried out only after obtaining the signature of the Free and Informed Consent Form (FICF) by the participants.

The risks when participating in the research were minimal and may include some embarrassment and/or discomfort in answering the evaluative questions. However, the freedom of participants to answer or not answer the questions was emphasized, with the freedom to withdraw at any time from the research being allowed.

Regarding the benefits associated with this research, it is possible to mention that the data obtained may help in taking measures to improve the teaching of anatomy to nursing students. They may also generate greater knowledge for the scientific community about the foundations of didactic methodology in the teaching-learning process for academics. Furthermore, it is believed that the present study may suggest some trends; raise new discussions and generate new questions that can add to other studies.

The Shapiro-Wilk normality test was performed where, after determining normality, a paired T test was used to compare the same group and an unpaired T test was used to compare groups. If there was no normal distribution, the Wilcoxon test was performed for comparison within the same group and the Mann-Whitney test was performed for comparison between groups. A value of $p<0.05$ is considered statistically significant. Statistical tests were carried out using the GraphPadPrism 6 program.

Validation

The evaluation of the board game made it possible to analyze the active methodology, highlighting whether the game contributed to the consolidation of the content of AVF arteriovenous fistula in the teaching and learning process of nursing students at the University of Rio Verde - UniRV. It was verified the need to carry out qualitative validation of the board, with the aim of avoiding errors in the teaching and learning process and promoting greater anatomical and clinical fidelity of this content (Table 1).

Table 1. Validation of the board game through questioning as an assessment tool.

Assessment Instrument	Median (max and min)
The board game sparked interest in learning.	5 (5 max and 5 min)
The size and quality of the board game helped in studies on arteriovenous fistula.	5 (5 max and 4 min)
The board game covers the essential structures of the arteriovenous fistula.	5 (5 max and 5 min)
The board game helped in the process of memorizing the irrigation structures of the upper limbs and arteriovenous fistulas.	5 (5 max and 5 min)
The proposed objectives are structurally appropriate in the board game.	5 (5 max and 5 min)
The theoretical knowledge of nursing students about arteriovenous fistulas stimulates knowledge about the main blood vessels.	5 (5 max and 5 min)
Using the board game as an active methodology helps students to better absorb knowledge about arteriovenous fistula.	5 (5 max and 5 min)

Source: Santos, MDLAD (2023)

In this research, validity was carried out through evaluation by judges graduated in nursing, considering the context in which they were inserted. The judges were invited by email.

To validate the board game, a specific data collection instrument was developed, consisting of seven categories referring to the active methodology of the board game. The judges validated the protocol in relation to the didactic nature of the game, functionality of the active methodology, cohesion regarding adequate knowledge of blood vessels. After analysis, they rated each item for clarity on a five-point scale: 1 = inadequate; 2 = adequate with changes; 3 = partially adequate; 4 = adequate; 5 = completely adequate.

If the judges marked options 1 = inadequate; 2 = adequate with changes or 3 = partially adequate, the items should be reformulated. In these items, the judges could also make suggestions and in this way, the content could be redone, improved, and subjected to a new evaluation.

Results and Discussion

Based on the questions applied to evaluators who had doctorates and master's degrees, we obtained validation of the board game as a learning tool, achieving maximum marks.

The pre-test and post-test were applied to the traditional group, as shown in figure 1, there was no statistical difference between the results. But looking at the graphs we can notice an increase in grades after applying the post-test. A study carried out with medical students using the pedagogical model of the UFMG Faculty of Medicine showed that the use of active methodology inside and outside the classroom contributed significantly to the development and learning of students[11]. Other studies corroborate the use of board games as an active methodology, in which playing makes knowledge more playful and didactic, providing lightness in learning, using the game students learn from each other, an exchange of knowledge occurs between them, generating a better development of the topics covered[12].

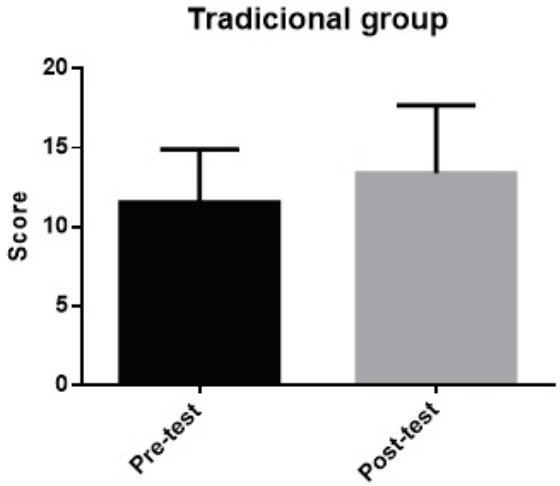

Figure 1. Pre-test and post-test scores from the traditional group.
Source: Santos, MDLAD (2023)

According to figure 2, when comparing the control group's scores after using the board game and applying the post-test, there was a statistically significant difference between the pre-test and post-test of the intervention group ($p<0.0001$). A study proposed the use of a game as a teaching tool for learning anatomy, as it was seen that many students had difficulty learning when it comes to anatomical structures, which shows that the methodology used stimulates the constructive process of action-reflection -action, develops in the student the spirit of teamwork, the interest in discovering the outcome of proposed situations, develops their power of creation and creates bonds of friendship [13].

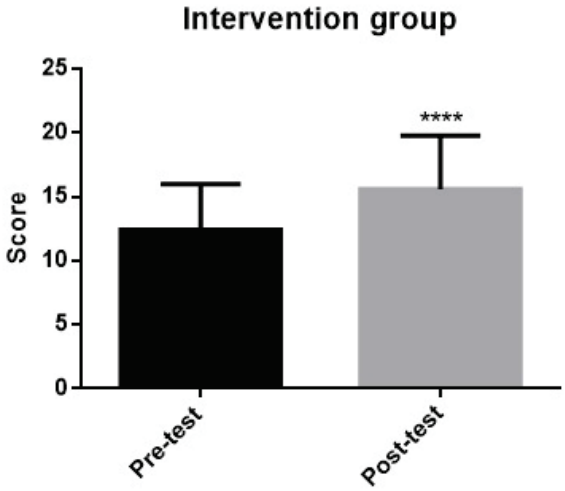

Figure 2. Pre-test and post-test scores for the intervention group.
Source: Santos, MDLAD (2023)

The figure 3 shows the scores of the control and intervention groups. As observed, there was no statistical difference between the TG and IG in the pre-test. TG – Traditional group. IG – Intervention group. In this case we consider it a positive aspect, as it shows that both groups have the same level of prior knowledge about the content.

As seen in figure 4, which presents the post-test scores for both groups, there was no statistical difference between the TG and IG in the post-test. TG – Traditional group. IG – Intervention group. In this case it means a negative aspect, as it shows that there was no proof of learning from using the proposed methodology. But when we analyze the graph, it is possible to notice that there was growth in the intervention group, showing that there was a gain in knowledge. A study shows that through active methodologies the student becomes a co-ordinator of their own learning, as they adopt a more active stance and share the possibility of more meaningful learning together with the teacher and the class [14–16].

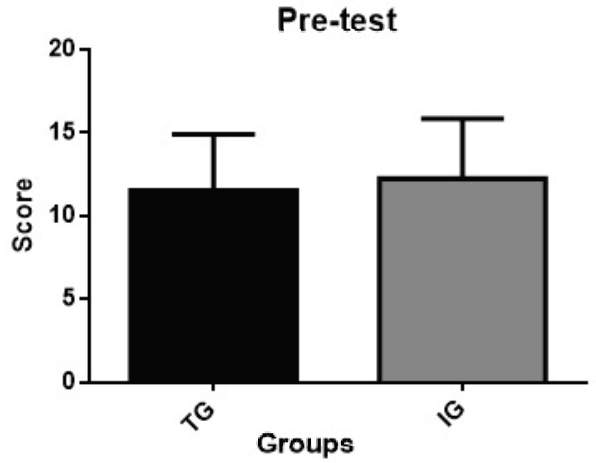

Figure 3. Pre-test scores for the control group and intervention group. Source: Santos, MDLAD (2023)

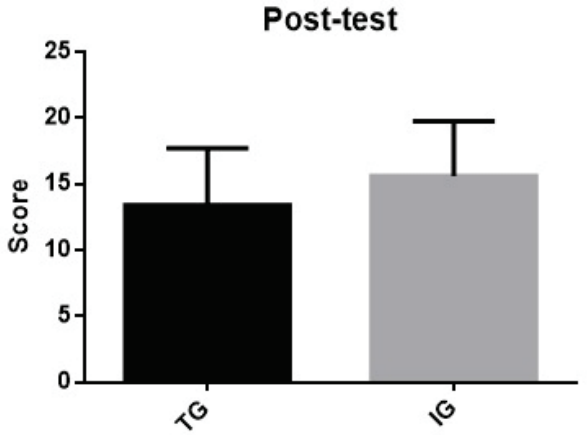

Figure 4. Post-test scores from the control group and intervention group. Source: Santos, MDLAD (2023)

Arteriovenous fistula (AVF) is a crucial surgical procedure in the context of hemodialysis, widely used to provide vascular access to patients with chronic kidney disease. During this procedure, a vein is anastomosed directly to an artery, creating robust and long-lasting vascular access. This connection allows multiple punctures to be performed for hemodialysis, facilitating the therapeutic process, and reducing the need for frequent invasive interventions.

However, it is essential to understand that the AVF requires adequate maturation time before it can be used for hemodialysis. This period, generally ranging between 8 and 12 weeks, is necessary for the AVF to develop adequate strength and blood flow to support the hemodialysis process effectively and safely. The choice of AVF type is an important consideration, with the radiocephalic fistula often being preferred as the first option due to its high success rate and low complication rates.

Other options, such as brachiocephalic and brachiobasilic fistulas, may also be considered, depending on the patient's anatomical characteristics and surgical preferences. Ultimately, a comprehensive understanding of AVF-related principles and practices is essential to ensure adequate vascular access and quality of care in patients undergoing hemodialysis.

Final Considerations

The present study shows that the board game used as an active methodology tool contributes positively to the learning of academics, with the results obtained it is possible to observe that the use of the active methodology used through the application of the board game as a methodological resource, achieved an improvement in the quality of teaching about the anatomy of the upper limbs and arteriovenous fistulas, which makes the game a viable methodology proposal for teaching anatomy for nursing.

Furthermore, this study shows us that it is possible to bring knowledge to the classroom in a more playful way, making classes enjoyable and light for students. During the research it was possible to notice the students' interest in using a different methodology, making them feel free to play and learn.

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