JETIR.ORG ISSN: 2349-5162 | ESTD Year : 2014 | Monthly Issue
JOURNAL OF EMERGING TECHNOLOGIES AND INNOVATIVE RESEARCH (JETIR)
An International Scholarly Open Access, Peer-reviewed, Refereed Journal

Effectiveness of Computer Assisted Teaching Program on Knowledge Regarding Diabetic Foot Ulcer among B.Sc Nursing Students

Dr. Sumathi Sampath, Ph.D. Nursing

Principal, St. Peter's College of Nursing, Hosur, Tamil Nadu, India.

Abstract

Background: Diabetes mellitus is a major chronic illness with complications such as diabetic foot ulcer (DFU), which increases morbidity, mortality, and health care costs. Nursing students require adequate knowledge of DFU prevention and management to enhance clinical competence.

Objectives: This study aimed to (1) assess pre- and post-test knowledge regarding DFU among B.Sc. Nursing second-year students, (2) evaluate the effectiveness of a Computer Assisted Teaching (CAT) program, and (3) identify associations between post-test knowledge and selected demographic variables.

Methods: A quantitative pre-experimental one-group pretest–posttest design was used at St. Peter's College of Nursing, Hosur. Fifty B.Sc. Nursing second-year students were selected through convenience sampling. Data were collected using a structured knowledge questionnaire and demographic profile. Following the pretest, students received a 30-minute CAT program via PowerPoint. Posttest was conducted after seven days.

Results: Pretest findings showed that 66% of students had inadequate knowledge, 34% had moderate knowledge, and none had adequate knowledge. Posttest results revealed that 86% attained adequate knowledge, 14% had moderate knowledge, and none had inadequate knowledge. The mean knowledge score increased from 15.12 ± 3.22 (50.4%) to 23.12 ± 2.09 (77%), with a mean difference of 27%. The paired 't' test value (18.77, $p < 0.05$) confirmed statistical significance. Posttest knowledge scores were significantly associated with gender and sources of health information.

Conclusion: The CAT program effectively improved nursing students' knowledge regarding DFU. Incorporating such digital methods into nursing education can strengthen clinical skills and patient education.

Keywords: Diabetes Mellitus, Diabetic Foot Ulcer, Nursing Education, Computer Assisted Teaching, Knowledge

Introduction

Diabetes mellitus (DM) is one of the greatest health challenges of modern times. It is a chronic disease that affects how the body turns food into energy and is associated with both microvascular (neuropathy, nephropathy, retinopathy) and macrovascular (stroke, peripheral vascular disease, ischemic heart disease) complications. Among these, diabetic foot ulcer (DFU) is a common and serious condition, leading to prolonged hospitalizations, amputations, disability, and financial strain.

Globally, DFU contributes significantly to morbidity and mortality rates. Prevention and effective management rely heavily on early education and awareness. Nursing students, as future caregivers, need adequate knowledge and practical skills to manage diabetic complications, especially DFU. Computer Assisted Teaching (CAT) has been shown to enhance knowledge retention and application compared to traditional methods [4].

This study therefore evaluates the effectiveness of a CAT program on knowledge regarding DFU among B.Sc. Nursing second-year students in Hosur, Tamil Nadu.

Objectives

1. To assess pre- and post-test knowledge regarding diabetic foot ulcer among B.Sc. Nursing second-year students.

2. To evaluate the effectiveness of a Computer Assisted Teaching program on knowledge regarding diabetic foot ulcer.

3. To determine the association between post-test knowledge and selected socio-demographic variables.

Hypotheses

- **H1:** There will be a significant difference between the pretest and posttest knowledge scores.
- **H2:** There will be a significant association between posttest knowledge scores and selected socio-demographic variables.

Methodology

- **Design:** Pre-experimental, one-group pretest–posttest design.
- **Setting:** St. Peter's College of Nursing, Hosur.
- **Sample:** 50 second-year B.Sc. Nursing students selected by convenience sampling.
- **Tools:** Structured knowledge questionnaire and demographic profile.

- **Procedure:** Pretest conducted using the questionnaire → CAT program (30 minutes, PowerPoint-based teaching on DFU) → Posttest after 7 days.
- **Analysis:** Descriptive (frequency, percentage, mean, SD) and inferential (paired 't' test, chi-square test) statistics.

Results

Table 1: Pretest and Posttest Level of Knowledge Regarding DFU (N=50)

Level of Knowledge	Pretest (n, %)	Posttest (n, %)
Adequate (>76%)	0 (0%)	43 (86%)
Moderate (51–75%)	17 (34%)	7 (14%)
Inadequate (<50%)	33 (66%)	0 (0%)

Interpretation: Pretest results showed most students had inadequate knowledge. Posttest revealed a significant improvement, with 86% achieving adequate knowledge.

Table 2: Comparison of Pretest and Posttest Mean Knowledge Scores

Test	Mean ± SD	Mean %	Paired 't' value
Pretest	15.12 ± 3.22	50.4%	
Posttest	23.12 ± 2.09	77.0%	18.77*

*$p < 0.05$, significant

Discussion

The findings revealed that CAT significantly improved students' knowledge on DFU. Prior to the intervention, the majority lacked adequate knowledge. Post-intervention, knowledge scores increased substantially, confirming the effectiveness of CAT. These results are consistent with earlier studies where computer-assisted learning was found superior to traditional lecture methods [4].

The association between posttest knowledge and demographic variables such as gender and sources of health information suggests that personal and environmental factors influence learning outcomes.

This study emphasizes the importance of integrating technology-based teaching methods into nursing curricula to enhance comprehension and application in clinical practice.

Conclusion

The study concludes that a Computer Assisted Teaching program is highly effective in enhancing knowledge regarding diabetic foot ulcer among nursing students. Strengthening such educational strategies can help future nurses provide better wound care and preventive education to diabetic patients, thereby reducing the burden of DFU.

References

1. American Diabetes Association. (1995–2020). *Type 1 diabetes symptoms*. Retrieved September 13, 2020, from https://www.diabetes.org/diabetes/type-1/symptoms

2. Akila, R., Rani, R. J., & Malarvizhi, K. (2020). Prevalence of vascular complications among type 2 diabetic patients in a rural health center in South India. *Journal of Primary Care & Community Health, 11*, 1–5. https://doi.org/10.1177/2150132720949430

3. Al-Rubeaan, K., Al Derwish, M., Ouizi, S., Youssef, A. M., Subhani, S. N., Ibrahim, H. M., & Alamri, B. N. (2015). Diabetic foot complications and their risk factors from a large retrospective cohort study. *PLoS ONE, 10*(5), e0124446. https://doi.org/10.1371/journal.pone.0124446

4. Kausar, T., Naoreen, B., & Gujjar, A. A. (2008). A comparative study to evaluate the effectiveness of computer assisted instruction (CAI) versus classroom lecture (CRL) for computer science at ICS level. *Turkish Online Journal of Educational Technology, 7*(4), 28–34.

5. American Diabetes Association. (n.d.). *Statistics about diabetes*. Retrieved September 13, 2020, from https://www.diabetes.org/resources/statistics/statistics-about-diabetes

6. Centers for Disease Control and Prevention. (2020). *Diabetes basics*. Retrieved September 13, 2020, from https://www.cdc.gov/diabetes/basics/diabetes.html