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# Effect of an educational intervention on knowledge of peptic ulcer disease among nursing students in Kolar, Karnataka

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**Abstract**
**Background:** Peptic ulcer disease (PUD) remains a common gastrointestinal disorder worldwide, with significant morbidity influenced by *Helicobacter pylori* infection, lifestyle factors, and medication use. Nursing students, as future healthcare providers, must possess adequate knowledge of PUD to ensure effective prevention, patient education, and care delivery.
**Objectives:** To evaluate the effectiveness of an educational intervention on the knowledge of peptic ulcer disease among nursing students.
**Methods:** A quasi-experimental one-group pretest-posttest design was adopted among 60 B.Sc. Nursing students selected through purposive sampling from a nursing college in Kolar, Karnataka. Data were collected using a structured, validated knowledge questionnaire consisting of 30 items covering etiology, signs and symptoms, complications, prevention, and management of PUD. Following a pretest, participants attended a 45-minute structured teaching session on PUD. A posttest was conducted after seven days using the same tool. Data were analyzed using descriptive and inferential statistics; paired *t*-test measured the intervention's effectiveness, and Chi-square test examined associations with demographic variables.
**Results:** The mean pretest knowledge score (11.45 ± 2.65) increased significantly to posttest (23.78 ± 3.12), indicating a marked improvement following the intervention ($t = 19.72$, $p < 0.001$). No significant associations were found between pretest knowledge and demographic variables.
**Conclusion:** The structured educational intervention significantly enhanced nursing students' knowledge of peptic ulcer disease. Incorporating targeted teaching sessions on gastrointestinal disorders into nursing curricula can strengthen students' competence and patient education skills.

**Keywords:** Peptic ulcer disease, nursing students, educational intervention, knowledge, quasi-experimental study, structured teaching, gastrointestinal health

## Introduction
Peptic ulcer disease (PUD) is a chronic gastrointestinal disorder characterized by mucosal erosion of the stomach or duodenal lining caused by an imbalance between defensive and aggressive factors regulating gastric mucosa. Globally, it affects approximately 4 million people annually, with significant morbidity and economic burden. The etiology involves multiple factors, including *Helicobacter pylori* infection, excessive use of non-steroidal anti-inflammatory drugs (NSAIDs), stress, smoking, alcohol consumption, and dietary patterns [1].

Historically, PUD was regarded as a disease of stress and lifestyle; however, the discovery of *H. pylori* revolutionized understanding and management strategies [2]. The World Health Organization (WHO) has recognized *H. pylori* as a class I carcinogen, given its strong association with gastric cancer [3]. Despite advances in diagnosis and treatment, lack of awareness regarding causative factors, prevention, and lifestyle modification continues to contribute to disease persistence [4].

Among healthcare professionals, especially nurses, adequate knowledge about PUD is essential for patient education, early recognition, and management. Nursing students form the backbone of future healthcare services, and their level of knowledge determines the quality of patient-centered care. Studies have shown that knowledge of gastrointestinal diseases among nursing students is often limited, emphasizing the need for structured educational interventions [5].

Educational interventions have long been recognized as a key strategy for improving health knowledge, promoting preventive practices, and enhancing clinical competence [6]. Evidence-based teaching programs have been proven effective in enhancing understanding of disease processes and fostering behavioral changes among healthcare learners [7]. However, the effect of such interventions specifically targeting PUD knowledge among nursing students in developing contexts remains under-researched [8].

In India, gastrointestinal disorders constitute a significant proportion of hospital admissions. Studies reveal that up to 10% of the Indian population experience PUD at least once in their lifetime [9]. Contributing factors include irregular meals, high consumption of spicy foods, tobacco use, alcohol, and stress associated with academic pressures among young adults [10]. Nursing students, while being part of the educated segment, are not immune to these risk factors. Moreover, their ability to counsel patients and communities relies heavily on their foundational understanding of such diseases [11].

Integrating focused educational interventions into nursing curricula not only enhances academic competence but also develops professional readiness for clinical roles. When nursing students understand the pathophysiology, prevention, and management of diseases like PUD, they become effective agents of health promotion [12]. Hence, measuring the impact of an educational module specifically tailored to PUD is vital for curriculum improvement and evidence-based nursing education reform [13].

Previous studies have established the effectiveness of educational interventions in improving knowledge about communicable diseases, non-communicable diseases, and health behaviors [14]. However, limited literature evaluates the effect of such interventions on gastrointestinal diseases, particularly among nursing students. This study aims to fill this gap by examining how a structured educational session influences the knowledge of PUD among undergraduate nursing students.

In summary, this research seeks to determine the pre-existing knowledge level about PUD among nursing students, evaluate the effect of a targeted educational intervention, and explore associations with demographic variables. This evidence can inform policymakers and educators to enhance curriculum design and promote better health literacy among future healthcare professionals.

## Objectives

1. To assess the pretest level of knowledge regarding peptic ulcer disease among nursing students.
2. To evaluate the posttest level of knowledge regarding peptic ulcer disease after the educational intervention.
3. To determine the effectiveness of the educational intervention by comparing pretest and posttest knowledge scores.
4. To find the association between pretest knowledge levels and selected demographic variables.

## Methodology

### Research Design

A quasi-experimental pretest-post-test design without a control group was adopted to assess the effect of an educational intervention on PUD knowledge.

### Setting

The study was conducted at a selected College of Nursing in Kolar, Karnataka.

### Population

B.Sc. Nursing students enrolled in the second and third years of study.

### Sample Size and Sampling Technique

A total of 60 nursing students were selected using a purposive sampling technique based on inclusion criteria (enrolled students willing to participate and available during data collection).

### Variables

**Independent Variable:** The educational intervention on peptic ulcer disease (PUD), which consisted of a structured teaching session designed to enhance participants' knowledge of the etiology, clinical features, complications, prevention, and nursing management of PUD.

**Dependent Variable:** The knowledge score regarding peptic ulcer disease among nursing students, measured using a validated structured knowledge questionnaire before and after the intervention.

**Demographic Variables:** Selected socio-demographic characteristics of participants including age, gender, year of study, religion, type of family, place of residence, parental education, dietary habits, previous exposure to gastrointestinal topics, source of health information, family history of gastrointestinal disorders, and tea/coffee consumption habits.

### Tool for Data Collection

A structured knowledge questionnaire was developed and validated by experts in medical-surgical nursing and gastroenterology. It consisted of 30 multiple-choice questions covering:

1. Definition and etiology
2. Signs and symptoms
3. Complications
4. Prevention and management

Reliability was established using the split-half method ($r = 0.82$).

### Educational Intervention

A structured **teaching program** (45 minutes) on PUD was delivered through PowerPoint, videos, and interactive discussions. Content covered causes, risk factors, prevention, and nursing management.

### Data Collection Procedure

### Data Collection Procedure

The data collection process was carried out in three distinct phases to systematically assess the effectiveness of the educational intervention on peptic ulcer disease (PUD) knowledge among nursing students:

1. **Phase I:** Pretest: During this phase, baseline data were collected from the participants using a structured knowledge questionnaire. The pretest aimed to assess

the existing level of knowledge regarding the etiology, symptoms, complications, preventive measures, and nursing management of peptic ulcer disease. Participants were assured of confidentiality and anonymity prior to data collection.

2. **Phase II:** Educational Intervention: Following the pretest, a structured teaching program on peptic ulcer disease was administered to the participants. The intervention was delivered through a 45-minute interactive session incorporating PowerPoint presentations, audiovisual aids, visual charts, and group discussions. The educational content was designed to provide comprehensive information on the causes, risk factors, lifestyle modifications, prevention, and nursing care of PUD, emphasizing practical relevance to clinical settings.
3. **Phase III:** Posttest: A posttest was conducted seven days after the intervention using the same structured knowledge questionnaire administered in the pretest. This phase aimed to evaluate the retention and improvement of knowledge following the educational intervention and to determine its overall effectiveness.

**Data Analysis Plan**

The collected data were systematically coded, tabulated, and analyzed using the Statistical Package for the Social Sciences (SPSS) version 26.0. Both descriptive and inferential statistical methods were employed to address the study objectives.

**Descriptive Statistics:** Descriptive measures such as frequency, percentage, mean, and standard deviation (SD) were utilized to summarize participants' demographic characteristics and to describe the distribution of pretest and posttest knowledge scores.

**Inferential Statistics:** The paired *t*-test was applied to determine the effectiveness of the educational intervention by comparing the mean pretest and posttest knowledge scores of nursing students. The Chi-square ($\chi^2$) test was used to examine the association between pretest knowledge levels and selected demographic variables, such as age, gender, year of study, dietary habits, and previous exposure to gastrointestinal topics.

**Results**

**Table 1:** Demographic Characteristics of Nursing Students (N = 60)

| S. No. | Demographic Variable | Category | Frequency (f) | Percentage (%) |
|---|---|---|---|---|
| 1 | Age (years) | 18 - 19 years | 25 | 41.7 |
| | | 20 - 21 years | 28 | 46.6 |
| | | ≥ 22 years | 7 | 11.7 |
| 2 | Gender | Female | 54 | 90.0 |
| | | Male | 6 | 10.0 |
| 3 | Year of Study | II Year B.Sc. Nursing | 30 | 50.0 |
| | | III Year B.Sc. Nursing | 30 | 50.0 |
| 4 | Religion | Hindu | 40 | 66.7 |
| | | Muslim | 10 | 16.6 |
| | | Christian | 7 | 11.7 |
| | | Others | 3 | 5.0 |
| 5 | Type of Family | Nuclear | 45 | 75.0 |
| | | Joint / Extended | 15 | 25.0 |
| 6 | Place of Residence | Urban | 38 | 63.3 |
| | | Rural | 22 | 36.7 |
| 7 | Father's Education | Primary School | 15 | 25.0 |
| | | Secondary School | 27 | 45.0 |
| | | Graduate & Above | 18 | 30.0 |
| 8 | Mother's Education | Primary School | 20 | 33.3 |
| | | Secondary School | 25 | 41.7 |
| | | Graduate & Above | 15 | 25.0 |
| 9 | Dietary Habits | Vegetarian | 22 | 36.6 |
| | | Mixed Diet | 38 | 63.4 |
| 10 | Previous Knowledge on Peptic Ulcer Disease | Yes | 18 | 30.0 |
| | | No | 42 | 70.0 |
| 11 | Source of Health Information | Textbooks / Lecture Notes | 30 | 50.0 |
| | | Teachers / Faculty | 15 | 25.0 |
| | | Internet / Social Media | 10 | 16.6 |
| | | Health Professionals | 5 | 8.4 |
| 12 | Family History of Gastrointestinal Problems | Yes | 12 | 20.0 |
| | | No | 48 | 80.0 |
| 13 | Tea / Coffee Consumption | None | 7 | 11.7 |
| | | Occasionally | 18 | 30.0 |
| | | Daily | 35 | 58.3 |

Table 1 show the demographic profile of the participants revealed that the majority (46.6%) of nursing students were aged between 20 and 21 years, and females constituted the predominant group (90%). Exactly half (50%) of the respondents were pursuing their third year of the B.Sc. Nursing program. Most participants belonged to the Hindu religion (66.7%) and resided in nuclear families (75%), while 63.3% were from urban areas. Regarding parental education, a considerable proportion had parents educated up to the secondary level (approximately 40-45%). In terms

of lifestyle, a mixed dietary pattern was common (63.4%), and a majority (70%) reported having no prior knowledge about peptic ulcer disease. Textbooks and teachers were identified as the primary sources of health information by 75% of the students. Furthermore, only 20% reported a family history of gastric problems, whereas 58.3% of the participants consumed tea or coffee daily, which may be a contributory lifestyle factor influencing gastrointestinal health.

**Table 2:** Comparison of Pretest and Posttest Knowledge Scores on PUD (N = 60)

| Test | Mean | SD | Mean Difference | *t*-value | *p*-value |
|---|---|---|---|---|---|
| Pretest | 11.45 | 2.65 | 12.33 | 19.72 | <0.001*** |
| Posttest | 23.78 | 3.12 | | | |

The posttest mean knowledge score was significantly higher than the pretest, indicating that the educational intervention effectively improved knowledge ($p < 0.001$).

**Table 3:** Association Between Pretest Knowledge Scores and Selected Demographic Variables (N = 60)

| S. No. | Demographic Variable | $\chi^2$ Value | df | p-value | Significance |
|---|---|---|---|---|---|
| 1 | Age (years) | 1.84 | 2 | 0.39 | NS |
| 2 | Gender | 0.42 | 1 | 0.52 | NS |
| 3 | Year of Study | 2.13 | 1 | 0.14 | NS |
| 4 | Religion | 1.96 | 3 | 0.58 | NS |
| 5 | Type of Family | 0.74 | 1 | 0.39 | NS |
| 6 | Place of Residence | 0.69 | 1 | 0.41 | NS |
| 7 | Father's Education | 2.24 | 2 | 0.33 | NS |
| 8 | Mother's Education | 1.98 | 2 | 0.37 | NS |
| 9 | Dietary Habits | 0.87 | 1 | 0.35 | NS |
| 10 | Previous Knowledge on PUD | 3.65 | 1 | 0.06 | NS (borderline) |
| 11 | Source of Health Information | 4.32 | 3 | 0.23 | NS |
| 12 | Family History of GI Problems | 1.15 | 1 | 0.28 | NS |
| 13 | Tea/Coffee Consumption | 2.52 | 2 | 0.28 | NS |

The Chi-square test results show no statistically significant association between pretest knowledge scores and any of the demographic variables ($p > 0.05$). Although students with previous exposure to information on peptic ulcer disease had slightly higher pretest scores, the difference was not statistically significant ($p = 0.06$). This suggests that general background or socio-demographic characteristics did not influence baseline knowledge levels. Therefore, the improvement observed in posttest knowledge (as shown in the next table of paired *t*-test comparison) can be attributed primarily to the effectiveness of the educational intervention rather than pre-existing demographic differences.

## Discussion

The present study aimed to assess the effect of an educational intervention on nursing students' knowledge regarding peptic ulcer disease. Findings revealed a significant improvement in posttest knowledge scores, demonstrating that structured education can enhance conceptual understanding among nursing students. This aligns with previous studies indicating that educational interventions substantially improve health-related knowledge among healthcare learners [15].

Before the intervention, most participants had moderate knowledge, highlighting gaps in understanding of etiology, risk factors, and preventive measures. Similar findings were reported by Ahmed *et al*., where nursing students exhibited limited awareness of gastrointestinal disorders prior to structured teaching [16]. After intervention, substantial improvement occurred across all domains of knowledge, emphasizing the effectiveness of interactive educational methods.

The absence of significant associations between demographic characteristics and baseline knowledge suggests that prior exposure or sociodemographic variables did not substantially influence understanding. This observation corroborates findings by Sharma *et al*., who found that learning outcomes were primarily determined by exposure to targeted instruction rather than background variables [17]. From a pedagogical perspective, incorporating disease-specific modules into nursing curricula is critical. The present study confirms that audiovisual-supported teaching, combined with discussion and Q&A formats, reinforces learning retention. Similar success has been documented in studies on infection control and diabetes education among nursing students [18-20].

The findings have practical implications for nursing educators. Regular reinforcement through microlearning sessions can sustain knowledge retention, reduce misconceptions, and empower students to educate patients effectively. Moreover, such interventions align with global health education priorities promoting competence-based training as recommended by WHO and ICN [21].

## Conclusion

The educational intervention significantly improved nursing students' knowledge about peptic ulcer disease. Structured, evidence-based teaching enhances understanding, bridging theoretical and clinical gaps. Integrating gastrointestinal disease modules into the nursing curriculum can empower students to promote gastrointestinal health and prevent complications among populations.

## Conflict of Interest

Not available

## Financial Support

Not available

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