

## A Comparison between the Selected Students' Level of Perception toward Nursing Care among Patients with Chemotherapy-Induced Peripheral Neuropathy

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### Abstract

**Background:** Chemotherapy-induced peripheral neuropathy is the most common neurological side effect of chemotherapy. Despite of crucial benefits of chemotherapy, tumor management is often accompanied by severe side effects related to cancer or/and therapeutic interventions. Thus, nursing students' perception will play an important role in managing this painful condition. **Objective:** This study aimed to compare between the selected students' level of perception toward nursing care among patients with chemotherapy-induced peripheral neuropathy. **Subject and Methods:** A cross-sectional comparison research design was utilized with convenient samples of two groups that were recruited (Faculty students=224 students and Institute students=398 students). Recruiting a self-administered questionnaire link to identify and compare between the participants' perception about nursing care for chemotherapy-induced peripheral neuropathy in the prementioned settings. **Results:** The findings clarified that more than half of the studied nurses in both study groups were female, and their age ranged 18-22 years. More than half of the studied students in the faculty had a moderate level of perception compared with less than half of them in the institute. There was a statistically significant relationship stated between the student's level of perception about nursing care for chemotherapy-induced peripheral neuropathy in the faculty compared to the institute students with their demographic data ( $p \leq 0.05$ ). **Conclusion:** Definitely, the nursing faculty students in the current study had a high perception level compared to the nursing institute students. Furthermore, there was statistically significant relationship detected between student's level of perception about nursing care for chemotherapy-induced peripheral neuropathy and their affiliations in both study groups with  $p$  value  $\leq 0.05$ . **Recommendations:** Behalf of the study findings continuously directed education courses for students should be prepared to enhance their level of perception and their near-future roles. Further research studies are essential to identify their further education needs and the factors that influence the university students' perception level.

**Keywords:** Chemotherapy-induced neuropathy, Nursing care, Perception, Students.

### Introduction

The global population of cancer survivors has grown to more than 28 million people. [1] A large proportion of them experienced treatment-related side effects, such as chemotherapy-induced peripheral neuropathy (CIPN). [2] It is a common health issue that occurs when cancer patients receive neurotoxic chemotherapy. It is expected that 40 percent of cancer patients will have CIPN, depending on the duration of exposure and the use of standard chemotherapy regimens that include taxanes, plant alkaloids, platinum-based drugs, and bortezomib. [3] Reduced vibratory and cutaneous sensation, decreased proprioception, numbness, tingling, and burning, as well as neuropathic pain, are all caused by a variety of

motor, sensory, and autonomic nerve abnormalities. Weakness and injuries to motor neurons can cause muscular atrophy. Autonomic nerve damage can cause changes in blood pressure, constipation, urinary retention, sexual dysfunction, and activities of daily living (ADL) difficulties such as walking, which reduces quality of life (QOL) [4].

It is clear that nurses evaluate and treat general pain in cancer patients without distinguishing between nociceptive and neuropathic pain, which has a negative impact on CIPN treatment and lowers patients' quality of life. [5] However, oncology nurses play an important role in assessing CIPN clinical signs and patient-reported complaints. However, there are insufficient evidence-based instruments and

techniques to assess oncology nurses' performance in terms of CIPN evaluation and management, so it remains one of the many challenges that oncology nurses face. [6,7] Oncology nurses' knowledge of CIPN is limited; one source is that body system assessments are not included in oncology nurses' educational courses, and there are currently no standard guidelines for assessing and managing CIPN. [8] As a result, knowledgeable undergraduate students can improve patients' quality of life and outcomes as they prepare to become future oncology nurses. [9]

Perception is defined as an individual's recognition of team members' actions within a given context. [10] Raising perception of CIPN among undergraduate nurses improves patient treatment and quality of life. Clearly, early assessments in oncology patients can reduce patient complaints and complications by providing targeted intervention and treatment. [11] Unfortunately, in Egypt, there are fewer oncology education courses, no specialized courses for nursing students, and only a few research studies on oncology nurses' knowledge and practices regarding cancer pain. Therefore, the current study aimed to compare between the selected students' level of perception toward nursing care among patients with chemotherapy-induced peripheral neuropathy.

#### **Significance of the study:**

Nursing students are the future of nursing profession not in Egypt only but worldwide. So that, continuously evaluation their level of perception regarding learnt courses of life-threatening condition plays a pivotal role in fostering a sense of preparedness and safety among these patients, their families, hospitals, and healthcare workers directly those nurses. Furthermore, in the same line of national Egyptian vision 2030 goal (3) to identify health dipartites and promote the delivery of care [6,12].

Chemotherapy drugs and other treatments for cancer can cause further side effects such as peripheral neuropathy, a set of symptoms caused by damage to nerves. [13] Frequent side effects caused by antineoplastic agents, with a prevalence from 19% to over 85%. Clinically, CIPN is a mostly sensory neuropathy that may be accompanied by motor and autonomic changes of varying intensity and duration [14].

#### **Aim of the study:**

This study aimed to compare between the selected students' level of perception toward nursing care among patients with chemotherapy-induced peripheral neuropathy. The following objectives were pursued:

1. To assess the selected students' level of perception toward nursing care among patients with chemotherapy-induced peripheral neuropathy.
2. To compare between the selected students' level of perception toward nursing care among patients with chemotherapy-induced peripheral neuropathy.
3. To Identify relation between nurses' the selected students' level of perception toward nursing care among patients with chemotherapy-induced peripheral neuropathy with their demographic profile.

#### **Subject and Methods**

##### **Design of the study:**

A cross sectional comparison research design was utilized to fulfill the current study's objectives.

##### **Setting:**

The study was conducted from November 2019 to April 2020 in Faculty of Nursing and Nursing Institute, Suez Canal University at Ismailia city, Egypt.

##### **Sampling:**

A nonprobability convenient sample of all available nursing students, that involved in two groups (Faculty of Nursing =224 & Nursing Institute=398) that were from nursing branch at Suez Canal University in Ismailia city. Their willingness and approval to recruit in the current study is a requirement for participation post explanation its aim.

The Epi-Calc tool was used to determine sample size, considering precision (5%), Population (2300) and confidence level (90%). Students recruited at the mentioned settings made up the final study sample size of (622) with dropout rate (20%).

##### **The data collection process of this research**

It involved the utilization of one tool, a self-administrated online questionnaire. [6,15,16] It was divided into two parts:

- **Part (A):** It was developed by the researcher and concerned with demographic characteristics of the participant students as age, gender, academic year, marital status, and

housing condition, affiliations, and receiving educational related courses.

- **Part (B):** It adapted by the researcher based on previous related studies and guidelines related perception level of the participant students about nursing care for chemotherapy-induced peripheral neuropathy: it included 25-items in the form of multiple-choice questions and true or false.
- It was clarified student's perception level about nursing care for chemotherapy-induced peripheral neuropathy as definition, incidence & prevalence, clinical manifestations, risk factors & causes, diagnostic studies, prevention, assessment, and treatment modalities.

#### **Scoring system:**

The questionnaire items' scores were designed based on a valid model answer, which each correct answer was given one grade, and the total perception scores were classified as the following low level  $\leq 50\%$ , moderate level  $50-75\%$ , and high level  $>75\%$ . The collected data was coded, tabulated, and analyzed using IBM SPSS Statistics version 22.

The normality test was evaluated by the Kolmogorov-Smirnov test, which clarified parametric data  $\geq 0.05$ . Data were presented in the form of frequencies and percentages using descriptive statistics. The significance of the analyzed results was estimated at the  $\leq 0.05$  level utilizing Mann Whitney and Kruskal Wallis test for abnormally distributed of quantitative variables of studied groups.

#### **Tools developments:**

The researchers made some modifications to the tools after reviewing recent literature and previous related studies in the same concern of the research variables.

#### **Content Validity and Reliability:**

A Jury panel of five expertise in medical-surgical nursing and oncology medicine Suez Canal University revised the adapted tool to confirm its clarity, comprehensiveness, and applicability. The reliability of tool was evaluated by Cronbach's alpha test that clarified a highly internal consistency of the recruited tools (0.89).

#### **Ethical Considerations:**

Upon being provided with a clear explanation of the study's objectives, the nurses expressed their willingness to participate and before initiating the data collection process, they were thoroughly briefed about the study's purpose

and its overall nature. They were explicitly informed about their right to decline participation or withdraw from the study at any stage or to give any reasons without any obligations.

Furthermore, a crucial emphasis was placed on maintaining the confidentiality of the information they provided, ensuring that the collected data would be used solely for research purposes. The research approved by the faculty of Nursing, Suez Canal University, Ismailia City and mentioned study setting post explaining the study aim and methodology.

It also was clarified to students in a clear manner and provided online informed consent prior opening the study link. The researcher secured that the students' data would only be used for research purposes and kept confidential without interfering with their academic evaluation with the right to withdraw from the study at any time.

#### **Fieldwork:**

The researchers carried out the study in the following manner:

#### **Pilot study:**

Prior to initiating the primary study, a pilot study was performed on sixty students (10%) before conducting of the study to assess its clarity, applicability, and feasibility. There were no changes, and the findings were included in the study. The author contacted the students via their what's-up group, explained the purpose of the study and encouraged them to participate in the current study though a submitted online link within 3-6 minutes. Furthermore, the shared link contained a section explaining the study aim and confirming that their participation was voluntary, and they have the right to withdraw at any time.

#### **Current study:**

The comprehensive data collection process covered a duration of approximately six months, commencing from November 2019 to April 2020 in Faculty of Nursing and Nursing Institute at Suez Canal University, Ismailia city, Egypt. This extensive timeframe enabled the researchers to effectively collect data from the participants and ensure the accuracy and reliability of the findings. The researcher was always available to answer any questions or concerns.

The researcher shared the questionnaire link through students' e-mail and social contacts to evaluate level of perception toward nursing care for chemotherapy induced peripheral neuropathy. The researcher observed the cloud storage of

questionnaire daily for the participants in prementioned study settings. The researcher rechecked the collected data, provided simple feedback on the questionnaire results, and greeted the participants through auto-registration message on the link and coordinators in the study setting for their support and encouragement for students.

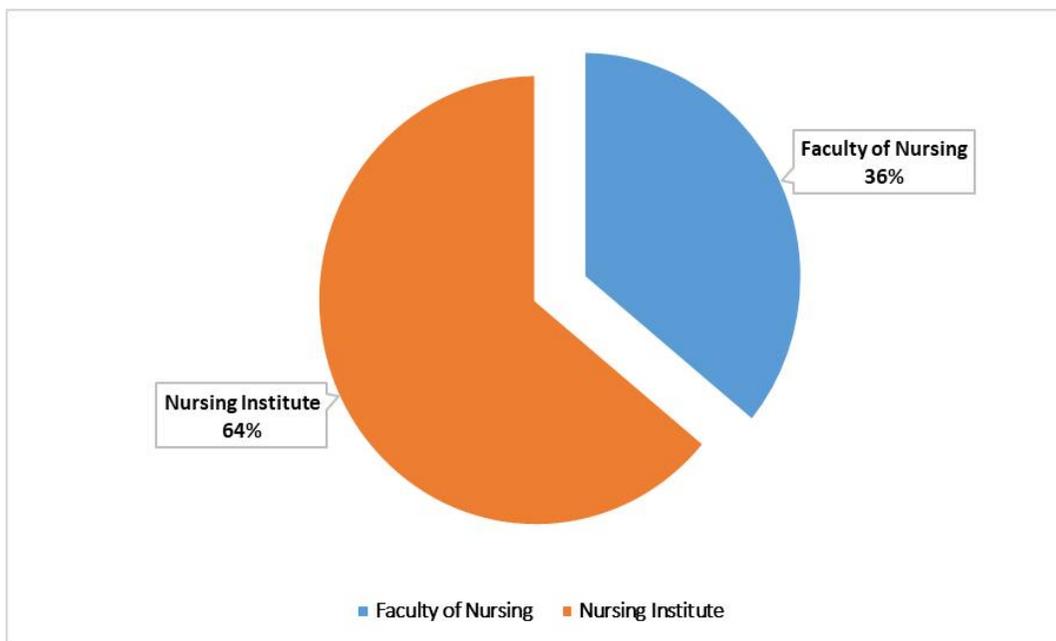
#### **Statistical Design**

The data were statistically analyzed, tabulated, and analyzed using the statistical program SPSS (version 20). The Kolmogorov–Smirnov test was used to determine if the acquired data were normal, and it was determined that the data were parametric. To describe patient characteristics, the collected data were reviewed for frequency and distribution. Variable differences were measured using independent sample t tests (t) for related groups, and the Pearson correlation coefficient (r) was used to determine how closely two variables were related. The significance level was set at  $p < 0.05$ .

**Results:****Table 1.** The frequency and distribution of the studied students related demographic characteristics in both study groups. (n=622)

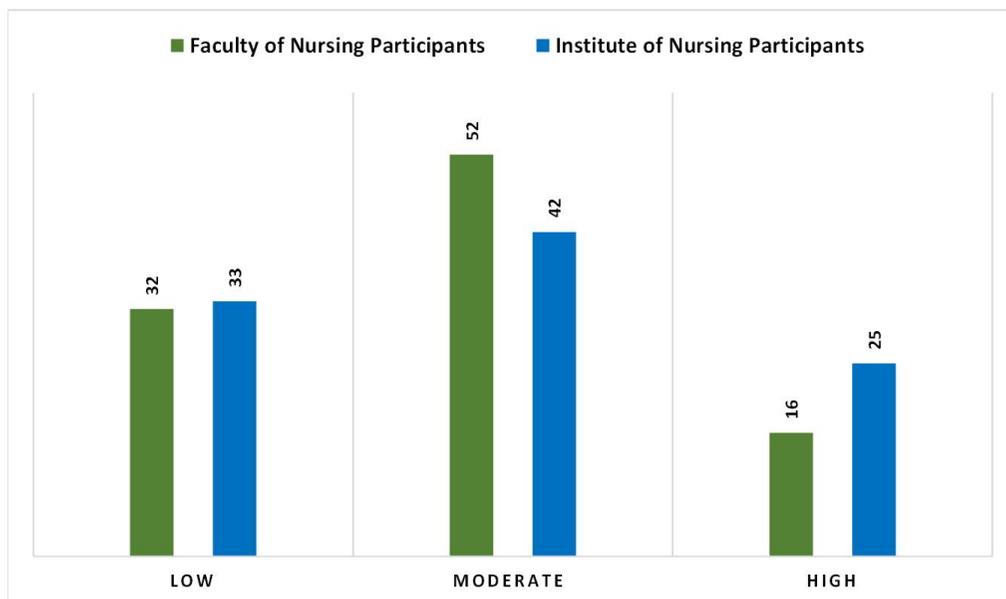
Demographic characteristics	Faculty of Nursing Participants (224)		Institute of Nursing Participants (398)		P. Value
	No.	%	No.	%	
<b>Age</b>					
▪ 18-22years	135	60	213	54	0.001
▪ ≥22 years	89	40	185	46	
Mean±SD=21±1.89					
<b>Gender</b>					
▪ Male	97	43	159	40	0.05
▪ Female	127	57	239	60	
<b>Marital status</b>					
▪ Single	199	89	291	73	0.59
▪ Engaged	22	10	96	24	
▪ Other	3	1	11	3	
<b>Academic level</b>					
▪ First	59	26	162	41	0.001
▪ Second	85	38	85	21	
▪ Third	55	25	89	22	
▪ Fourth	25	11	65	16	
<b>Receiving related educational courses</b>					
▪ Yes	156	70	331	83	0.05
▪ No	68	30	67	17	
SD: Standard deviation			Significant level at P value < 0.05		
Chi square test for qualitative data, while Independent T-test quantitative data					

**Table 1.** shows that less than two-thirds (60%) of the participant students were aged between 20-22 years in faculty of nursing participants, compared with more than half of them (54%) in nursing institute participants. About less than two-thirds of them in both groups were female and were single. Furthermore, more than one-third (38%) of them are in the second academic level in faculty of nursing, compared with more than one-third (41%) were in the first academic level in nursing institute. Approximately, both group participants did not receive related educational courses regarding nursing care of chemotherapy induced peripheral neuropathy. Moreover, there was significant correlation between both groups with demographic variables  $p \leq 0.05$ .



**Figure 1.** Frequency and distribution of the studied students related their affiliations both study groups. (*n*=622)

**Figure 1.** clarifies that less than three-quarters of them (64%) were from nursing institute, while less than half of them (36%) were from the faculty of nursing.



SD: Standard deviation      Level of perception: Low≤50%; Moderate=51-75; High>75%

**Figure 2.** Level the studied nurses’ perception about nursing care for chemotherapy-induced

peripheral neuropathy and their mean & standard deviation in both study groups. (n=622)

**Figure 2.** explains that less than one-quarter (16%) of the studied nurses had a high level of perception about nursing care for chemotherapy-induced peripheral neuropathy in the faculty of nursing, compared with one-quarter (25%) in the institute of nursing. Furthermore, more than half (52%) of them had moderate level of perception in the faculty of nursing group compared with less than half (42%) in the institute of nursing group. About one-third of both study groups had low level of perception about nursing care for chemotherapy-induced peripheral neuropathy.

**Table 2.** The relationship between student's level of perception about nursing care for chemotherapy-induced peripheral neuropathy and their affiliations in both study groups. (n=622)

Affiliation's name	N	Perception Level of Participants	Test (U)	Value (P)
		Mean ± SD.		
▪ Nursing Institute	224	52.10 ± 13.31	23.12	0.05*
▪ Faculty of Nursing	398	56.21± 12.30	19.62	0.01*
SD: Standard deviation		U: Mann Whitney test		*significant at $p \leq 0.05$

**Table 2.** shows that there was statistically significant relationship detected between student's level of perception about nursing care for chemotherapy-induced peripheral neuropathy and their affiliations in both study groups with  $p \text{ value} \leq 0.05$ ).



## Discussion

The current study's aim was to compare between the selected students' level of perception toward nursing care for chemotherapy-induced peripheral neuropathy in Suez Canal University at Ismailia city. Long-term cancer survival rates are increasing due to more effective targeted cancer treatments; however, chemotherapeutic medication side effects remain common. Chemotherapy-induced peripheral neuropathy, however, is a common and difficult side effect of several commonly used antineoplastic drugs (CIPN). [2,17] The identification of recent future nursing students' levels of knowledge is critical for assessing their required educational needs, which clearly impact both treatment efficacy and patient survival, as stated in Egypt Health Vision 2030. [5,6]

Concerning the current study participants' demographic characteristics, the existing study less than two-thirds of the participant students were aged between 20-22 years in faculty of nursing participants, compared with more than half of them in nursing institute participants. About less than two-thirds of them in both groups were female and were single. Furthermore, more than one-third of them are in the second academic level are in faculty of nursing, compared to more than one-third were in the first academic level in nursing institute. Approximately, both groups' participants did not receive related educational courses concerning nursing care of chemotherapy induced peripheral neuropathy. Moreover, there was significant correlation between both groups with demographic variables  $p \leq 0.05$ .

This findings from the researchers' view; academic students graduated from secondary school with eighteen years, highly admission rate to study the nursing branches in Egypt, light coverage for oncology part in nursing courses compared with the main courses. These results are compatible in the same direction with Sari et al., they stated from their study conclusions that there were 396 studied participants, encompassing 47 males and 349 females. More than one-third (73%) of them were in the academic phase. [18] This is

disagreed with by Vijayan et al., and Zeb et al., they reported that half of the study participants

(50%) were in the age group of below 20 years, and most (68%) of them were at nursing college. [19,20] The researcher clarified that this is probably related to the fact that most nursing students in Egypt graduated from nursing institutes and the ratio of female gender to male.

About students' perception, the current study less than one-quarter of the studied nurses had a high level of perception about nursing care for chemotherapy-induced peripheral neuropathy in the faculty of nursing, compared with one-quarter in the institute of nursing. Furthermore, more than half of them had moderate level of perception in the faculty of nursing group compared with less than half in the institute of nursing group. About one-third of both study groups had low level of perception about nursing care for chemotherapy-induced peripheral neuropathy. This concerned with highly performance and patent way in the faculty than institute, small number of students in faculty compared to institute participants as well as further studying courses in related branches.

It was processed by the author that most of them did not receive related training courses about CIPN, neglected related topics in education courses, or had a low academic level to catch related courses because approximately all were in their second year. This concern was encouraged by Hedenstrom, et al., who clarified that approximately all the studied nursing students had an inadequate level of knowledge about patients with cancer. [21] Also, in the same way by Al Qadire et al., they stressed that more than half of the participant students had a low level of knowledge about the management of chemotherapy-induced neutropenia. [16] Furthermore, there was disagreement with this study's outcome by Lisa et al., and Altre, & Chou they demonstrated in their study results that the majority of the participant students had an adequate level of knowledge regarding cancer [22, 23].

The current study enumerated that This table clarifies the relationship between student's total score of perception about nursing care for chemotherapy-induced peripheral neuropathy and their demographic characteristics in both study groups. It shows that the Mean±SD of perception was (12.02±4.00) for the study group age18-22 years among faculty of nursing participants compared with (11.15±1.95) among the institute of nursing participants. Furthermore, regarding academic level variable the Mean±SD of perception was (13.00±1.51) among second year faculty of nursing participants compared to (19.22±2.11) also second year institute of nursing. Clearly, the study participants concerning actual receiving training related courses, their level of perception in faculty of nursing was Mean±SD (16.30±3.18) compared to (12.35±3.11) among the study participants in the institute of nursing. Moreover, there was statistically significant relationship were estimated that there was statistically significant relationship detected between student's level of perception about nursing care for chemotherapy-induced peripheral neuropathy and their affiliations in both study groups with p value≤0.05.

Furthermore, there was statistically significant relationship were estimated between the participants student's level of perception about nursing care for chemotherapy-induced peripheral neuropathy and their demographic characteristics in both study group (age, gender, and academic level). Given the author's background, this is interpreted as a reflection of the students' level of perception, multiple affiliations, and culture. A lack of follow-up to education courses, a failure to identify students' learning needs, administrative support from course directors, and the frequent development of new course intended learning outcomes, all of which affect level of knowledge related to specific topics.

This confirmed result was approved by Mohammed et al., and, in the same way, by Saranya et al. even though both studies are in different places, indicating that there was a significant positive relation between the total level of participant students' knowledge and their demographic data (academic level and their affiliations). [24,25] Though the results

were inconsistent with the study's findings by Visovsky et al., and Latchman, they noticed that there was a non-significant relationship between the participant nursing students' perception level and socio-demographic data (p≤0.05). [26,27] Once the data for the current study was gathered from a single university, it was limited in its ability to be generalized to all undergraduate nursing students in the Canal Area. Additionally, responses may have indicated what nurses thought they should know rather than what they had learned. Lastly, a few related research topics regarding assessing nursing students' knowledge of CIPN for discussion with the study's results and managed by utilizing similar research variables.

### **Conclusion**

Constructed on the current study findings, the researchers can conclude that the nursing faculty students' group in the current study had a light high perception level compared to the second group nursing institute students. Furthermore, there was statistically significant relationship detected between student's level of perception about nursing care for chemotherapy-induced peripheral neuropathy and their affiliations in both study groups with p value≤0.05. There was statistically significant relationship were estimated between the participants student's level of perception about nursing care for chemotherapy-induced peripheral neuropathy and their demographic characteristics in both study group (age, gender, and academic level).

### **Recommendations:**

1. Continuously regular, and intermittently directed education courses for students should be prepared to enhance their level of perception and their near-future roles in both study groups.
2. There is a clear need to design a manual instructional scheme for CIPN to disseminate in the nursing clinical field plus theoretical educations.
3. Further research studies are essential to identify their further education needs and the factors that influence the university students' perception level.

### **Abbreviations**

Chemotherapy-induced neuropathy (CIPN); Activities of daily living (ADL); Quality of life (QOL).

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### **Competing interests**

This study contained no conflicts of interest.

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### **Availability of Data**

The datasets used and/or analyzed during the current study are available on reasonable request from the corresponding author.

### **Author Contribution**

The author automated data collection, methodology preparation, introduction, interpretation, conceptual framework, and tool conceptualization, as well as reference, manuscript design, and journal submission.

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